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# Sustainable Human Resource Management Nurtures Change-Oriented Employees: Relationship between High-Commitment Work Systems and Employees' Taking Charge Behaviors

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**Abstract:** In today's business world, the environment is changing rapidly. Employers need to rely upon their employees in order to produce long-term competitive advantage and sustainable performance. However, little research has investigated whether sustainable human resource management could prompt change-oriented behaviors in employees. By integrating the job demands–resources (JD-R) model and the proactive motivation model with the existing literature on sustainable human resource management, we explored the relationship between high-commitment work systems (HCWS) and the employees' taking charge behaviors. Data from 352 employees of 96 organizations provided support for the positive effect of HCWS on the employees' taking charge behaviors. The results of this study showed that HCWS affect the employees' taking charge behaviors through their work engagement only when they felt a high level of impact. Based on these results, we not only provide several theoretical contributions to the literature on HCWS and taking charge, but also provide some practical suggestions for how to nurture change-oriented employees using sustainable human resource management within the organizations.

**Keywords:** sustainable human resource management; high-commitment work systems; taking charge; work engagement; impact; change-oriented behavior

## 1. Introduction

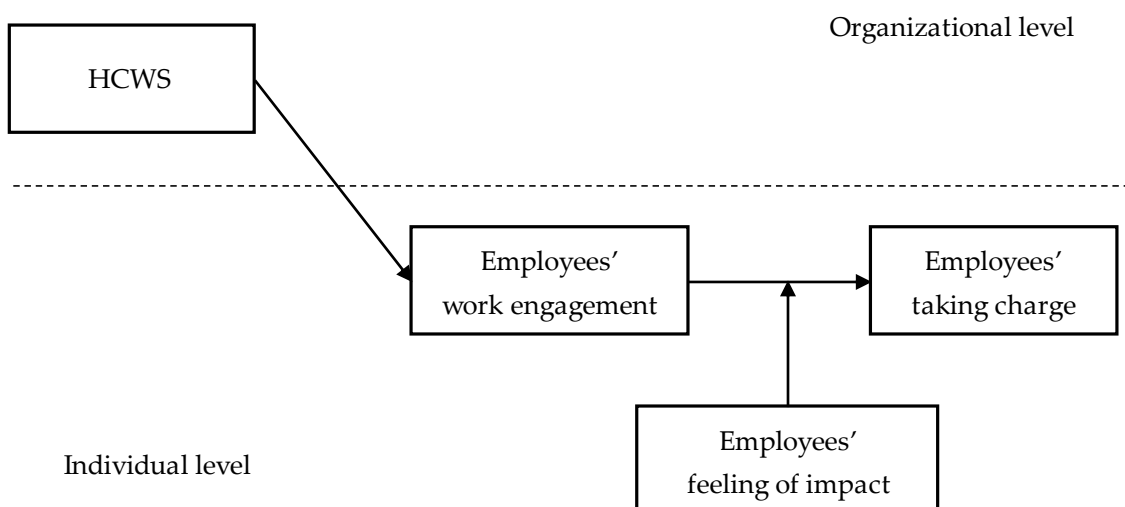
The pursuit of sustainable performance and sustainable competitive advantage is always a hot topic for the practitioners and scholars alike. Organizations are experiencing rapid changes in the business environment [1]. Many worldwide well-known companies, such as Nokia, Motorola, and Yahoo have suffered defeat in this environment. One of the major factors that leads to failure is that the executive managers cannot monitor and handle these challenges by themselves [2]. Organizations are increasingly relying on employees to detect and solve critical work problems and issues [3]. Accordingly, determining how to elicit sustainable change-oriented behaviors from the employees has drawn increasing research interest [4,5]. Among various forms of sustainable change-oriented behaviors, taking charge is critical for the sustainable performance of organizations because it “entails employees' voluntary and constructive efforts to effect organizationally functional change with respect to how work is executed within the contexts of their jobs, work units, or organizations” [2], which is aimed at continued improvement.

Although the employees' taking charge behaviors are invaluable to organizations in the changeable business environment, they have received limited research attention, especially in the research area of sustainability science. To the best of our knowledge, no work on employees' taking charge has

been published in leading journals of sustainability science. In this study, we aimed to examine the antecedents of employees taking charge. Previous works found that leadership (e.g., transformational leadership [6]), individual traits or trait-like factors (e.g., openness to experience [7]), and individual motivation (e.g., role breadth self-efficacy [7]) could increase employees' taking charge behaviors. However, limited research has drawn from the perspective of human resource management to explore its role in promoting the employees' taking charge behaviors.

In the work context, human resource management practices are widely known as the key to motivating or demotivating employee behaviors [8], and are responsible for a company's sustainability and competitive advantage [9]. Sustainable human resource management, which was defined as "the utilization of human resource management tools to help embed a sustainability strategy in the organization and the creation of a human resource management system that contributes to the sustainable performance of the firm" [10], may be a catalyst to stimulate employees to take charge more often. Accordingly, we wanted to explore the influence of the high-commitment work system (HCWS), which is a specific type of sustainable human resource management [11], on the employees' taking charge behaviors in this study.

We developed a conceptual model to examine the relationship between HCWS and the employees' taking charge behaviors by integrating the job demands–resources (JD-R) model [12] and the proactive motivation model [13]. Among the constructs in the conceptual model, HCWS was the independent variable, taking charge was the dependent variable, work engagement was the mediator, and the impact was the moderator. We expected that HCWS would increase the employees' taking charge behaviors through increasing employee's work engagement only when employees perceived themselves as having a high level of impact. Specifically, drawing on the JD-R model, HCWS could support employees and promote their work engagement by providing sufficient work and psychological resources [12,14]. Based on the proactive motivation model, "can do" and "energized to" were found to be two fundamental motivational states that work together to prompt individual proactive and change-oriented behaviors such as taking charge [13]. Hence, the employees' work engagement could not promote their taking charge behaviors without feeling like they have a high level of impact. We included work engagement (as the reflection of the "energized to" motivational state) and impact (as the reflection of the "can do" motivational state) in our conceptual model and examined their interaction effect on the employees' taking charge behaviors. We elaborated upon the development process of this conceptual model in the following section. The overall conceptual model is depicted in Figure 1.



**Figure 1.** The overall research models. *Note.* HCWS is short for high-commitment work systems.

Sustainability has become a hot topic worldwide. Sustainability science has contributed directly to the United Nations' (UN) goal of sustainable development, which has drawn the attention of combined natural and applied sciences, social sciences, and humanities [15]. In the research field of organizational psychology and human resource management, the research on sustainability is active. One of the research streams within sustainability science of organizational psychology and human resource management explores the role of sustainable human resource management in motivating employees' sustainable behaviors [10]. HCWS is a type of sustainable human resource management [11], and taking charge is a typical type of behavior that can help the organization achieve sustainable performance [2,4,5]. Although some research has examined the relationship between sustainable human resource management (e.g., HCWS) and employee's sustainable behaviors, limited research has explored the underlying psychological mechanism. Hence, increasing numbers of scholars have called for more research to understand the psychological processes in the science of sustainable development [16]. Work engagement and impact are important psychological factors that may explain the psychological processes in the sustainable development of organizations [17–20]. As shown in Figure 1, we integrated the constructs above by exploring the relationship between HCWS and employee's taking charge and by examining the mediating role of employees' work engagement and the moderating role of employees' feeling of impact.

We aimed to provide several theoretical contributions in this research. First, by investigating the influence of HCWS on the employees' taking charge behaviors, this study made a pioneering attempt to explore the relationship between sustainable human resource management and the employees' change-oriented behaviors. By doing so, we provide a more comprehensive understanding of how to enable employees to pursue sustainable performance in today's rapidly changing business environment. Second, we contribute to a burgeoning stream of research examining the mechanism linking management practices and change-oriented behaviors by identifying the mediating role of the employees' work engagement and the moderating role of the employees' feeling of impact. Although some studies examined the relationship between management practices and change-oriented behaviors from the perspective of the proactive motivation model [21], limited research simultaneously investigated the underlying mechanism of the "can do" and "energized to" motivational states. We attempted to do so by exploring the interactive effect of employee impact with work engagement on taking charge behavior. In addition, better examining this relationship answered the call for more studies to explore the psychological processes within sustainability research [16,22].

## 2. Theory and Hypothesis Development

### 2.1. HCWS

From the resource-based view, the sustained competitive advantage and sustainable performance of a firm result from the ownership of valuable, rare, imperfectly imitable, and non-substitutable resources [23]. Among all of a firm's valuable resources, a synergetic system of human resource management is considered to produce a sustainable competitive advantage because of its irreplaceable role in motivating employees to achieve goals and pursue excellent and sustainable performance of their organization [24,25]. Walton [26] concluded that two strategies exist to manage human resources: a "control" strategy and a "commitment" strategy.

In the past decades, the control-oriented workforce management strategy was predominant, because the employers expected to maximize the efficiency of their expenditures and reduce the cost of production and operation. The control strategy of human resource management worked well in the Industrial Age [27]. However, the world has rapidly changed from the production economy to the knowledge and information economy. Human resources or human capital have replaced material capital and become the key factor determining the competitiveness of companies. A system of human resource management that can encourage the commitment of the employees is now preferred for the majority of employers [28]. HCWS is one of the most studied topics of commitment-oriented strategy

for managing human resources [29], and refers to “a system of human resource management practices that aim to elicit employees’ commitment to the organization” [30].

Existing research reported the positive effects of HCWS on organizational performance [31,32], team performance [33], and employee attitudes and performance [34–36]. However, limited research explored the relationship between HCWS and the employees’ change-oriented behavior, which could be crucial for sustaining the long-term development and sustainable performance of companies [2,4]. Accordingly, we examined the influence and mechanism of HCWS on taking charge. Our rationale is explained in the following section.

## 2.2. HCWS and Taking Charge

Taking charge is a typical type of change-oriented behavior. According to Morrison and Phelps [2], taking charge can be considered an employee’s discretionary behavior that always “challenges the status quo and brings constructive changes to an organization”. Not every employee wants to take charge, because undertaking this behavior is highly risky and challenging [7]. Thus, an employee will decide whether or not to take charge depending on their perceived meaningfulness for taking charge, and their mindful calculation of the extent to which they can conduct taking charge behavior successfully [13].

In this study, we thought that HCWS can prompt employees’ taking charge behaviors for several reasons. First, HCWS includes practices such as high remuneration and information sharing, which may make an employee feel obligated to take charge. Employees who work in an organization employing HCWS can receive a high salary, benefits, and even profit sharing [30]. Based on the social exchange theory, if an employer treats its employees fairly over the long term, the employees will favor and reciprocate their employer’s treatment [37,38]. Hence, the employees who work in an organization using HCWS will feel obligated to do something beneficial for the long-term development and sustainable performance of their organization. Taking charge behaviors can bring constructive change to the organization, which are valuable and can be part of creating a sustained competitive advantage, especially in today’s rapidly changing business environment [2]. Employees conduct taking charge behaviors to reciprocate the high remuneration and information sharing offered by their employer.

HCWS includes practices that may strengthen an employee’s belief that they can successfully take charge. Extensive training and socialization are employed in HCWS [30], which may enable the employees to familiarize themselves with the working procedures and improve their competence in their roles. HCWS also includes enlarged jobs practice and job rotation to help the employees feel not only proficient in their own occupations, but also competent in related work [30]. Taking charge behaviors require proficient skills and professional knowledge in a wide range of work areas, which are quite challenging [6]. HCWS provides broad and effective training that the employees need and makes them feel confident to engage in taking charge.

HCWS includes practices that may strengthen an employee’s feeling of safety to try challenging tasks. For example, an employer that employs HCWS tries not to fire employees to increase the employees’ feeling of job security. Attitude-oriented and behavior-oriented rather than results-based performance appraisals are preferred by employers that use HCWS. All of these practices can ensure that the employees do not worry about the risk of reduced performance and even dismissal when they are engaging in taking charge behaviors. Although no research has investigated the relationship between HCWS and taking charge, some existing studies drew on social exchange theory and showed that HCWS could motivate employees to conduct organizational citizenship behaviors (OCB), which are also a kind of discretionary behavior [39]. Besides, Chen et al. [40] found that high-commitment human resource practices positively impact service employees’ proactive customer service performance. Taken together, we propose the following hypothesis:

**Hypothesis 1.** *HCWS is positively related to the employees’ taking charge. Specifically, when the organization applies more HCWS practices, the employees will conduct more taking charge behaviors.*

### 2.3. Underlying Psychological Mechanism

Although we have drawn on the HCWS and taking charge literature to theorize that HCWS has a positive effect on the employees' taking charge behaviors as discussed above, one key underlying psychological mechanism that we want to highlight is the employees' work engagement, which is defined as the situation in which "people employ and express themselves physically, cognitively, and emotionally during role performances" [41].

Based on the JD-R model, when job demands are analogous and constant, increased job resources can be used to promote an employee's work engagement [42]. As existing evidence shows, job resources are the most influential factors predicting the employees' work engagement [14,42]. Typical job resources include organizational, social, physical, or psychological aspects of a job that can help the employees achieve work goals, reduce their physiological and psychological costs accompanying the job demands, and stimulate their personal growth [12].

HCWS can promote the employees' work engagement by providing valuable, abundant, and continuous job resources. As discussed above, HCWS includes practices such as extensive training and socialization that can help the employees grasp the needed skills and experiences and attain their work goals. Based on the ability–motivation–opportunity (AMO) model, work motivation is also crucial for attaining work goals as well as the needed ability [43]. The fair treatment (e.g., high remuneration) offered and the egalitarianism atmosphere (e.g., participative decision-making) created by HCWS can elicit the employees' motivation to work hard.

HCWS also includes practices such as job enlargement and rotation, which can nurture an employee and stimulate their personal growth [30]. The development purpose of performance appraisal within HCWS can strengthen the employees' work self-efficacy and help them be the masters of their jobs [28]. A high level of job security and behavior-oriented performance appraisal can relieve the employees' uncertainty and reduce their physiological and psychological costs accompanying the job demands. Previous research has found that high-performance work systems (HPWS) can increase employees' work engagement [44]. Besides, Boon and Kalshoven [34] found that high-commitment human resource management is positively related to employee's work engagement. Taken together, we propose the following hypothesis:

**Hypothesis 2.** *HCWS is positively related to the employees' work engagement. Specifically, when the organization applies more HCWS practices, the employees will be more engaged in their work.*

Although work engagement is influential in inducing and sustaining the beneficial behaviors of the employees [42], we speculate that it translates into taking charge only when the employees feel they have a high level of impact. The proactive motivation model concluded that "can do" and "energized to" are two fundamental motivational states that motivate the employees' proactive and change-oriented behaviors such as taking charge [13]. Whereas the "can do" motivational state reflects "cold" and cognitive mechanism, the motivational state of "energized to" is a "hot" and affect-related motivation. The cold and hot motivational states should work together to prompt an individual's taking charge behaviors [13].

Work engagement can be considered as the motivational state of "energized to", which consists of a high-level activation of energy and affect. Although existing research has found that work engagement can predict employee performance [45] and organizational citizenship behavior [46], we think that it can motivate taking charge behaviors only when employees perceive they have a high level of impact. Specifically, the employees will engage in taking charge behaviors only when they think that they can successfully perform these behaviors [7]. Impact reflects "the degree to which an individual can influence strategic, administrative, or operating outcomes at work" [47]. A high-level feeling of impact can strengthen employees' beliefs that if they keep engaging in taking charge behaviors, they will finally be successful, and the organization will benefit from these change-oriented behaviors. Although no research has examined the interaction effect of work engagement with impact on employees' taking

charge behaviors, some research has found that work engagement is related to the employee's proactive behaviors only under some circumstances. For example, Schmitt et al. [48] found that work engagement is positively related to the employee's voice (which is also a kind of change-oriented behavior) only when the employee felt a low level of job strain. Taken together, we hypothesize that:

**Hypothesis 3.** *The employees' work engagement interacts with their feelings of impact to influence their taking charge. Specifically, employees' work engagement is positively related to their taking charge only when the employees have a high-level feeling of impact.*

We theorize that HCWS would increase the employees' work engagement in Hypothesis 2. We further propose that work engagement prompts taking charge behaviors when the employees had a high-level feeling of impact in Hypothesis 3. Taken together, we propose a hypothesis of the second-stage moderated indirect effect:

**Hypothesis 4.** *The employees' feeling of impact moderates the indirect relationship between HCWS and the employees' taking charge behaviors via their work engagement. Specifically, the indirect relationship between HCWS and employees' taking charge behaviors via work engagement only exists when the employees have a high-level feeling of impact.*

### 3. Methods

#### 3.1. Procedures and Sample

To test our conceptual model, we contacted 102 alumni who graduated from a large business school located in Central China and are now working in the HR departments of different organizations. Finally, 96 alumni agreed to participate in this study. The following data collection procedures were used for each organization. First, the alumni asked for permission to participate from the HR manager of each organization (only when the alumni were not the HR manager). Then, the HR manager of each organization was invited to participate in a short survey to evaluate the HCWS used in their organization. Second, we asked the alumni to randomly pick five employees to participate in the employee survey. The employees were asked to rate their degree of work engagement, feeling of impact, and some control variables, as well as provide some demographics information. Finally, with the help of the alumni, we asked the direct supervisor of each employee who had participated in the employee survey to participate in a short survey rating their employee's taking charge behaviors.

We distributed all the questionnaires via e-mail. A total of 352 employees matched with their direct supervisors from 96 organizations participated in the survey, with a final response rate of 73.3%. Among the sample employees, the average age was 31.37 (SD = 7.14, range 20 to 58), and 43.5% were women. The mean tenure of the sample employees was 5.83 years (SD = 5.41, range 0.08 to 30.17). Of the participants, 7.4% reported a high school education or below, 23.3% had associate degrees, 65.3% were university graduates, and 4.0% reported a masters education or above. Hence, the majority of the sample employees were well educated (92.6% had an associate degree or higher).

#### 3.2. Measures

We followed the back-translation procedure to translate the English version of the scales into Chinese [49].

HCWS was evaluated by the HR manager of each organization using the 15-item HCWS scale developed by Xiao and Björkman [30] on a seven-point scale (1 = strongly disagree, 7 = strongly agree). This scale perfectly fit our study, because it was developed for the Chinese context. Sample items included "Our organization has enlarged jobs and job rotation", "Our organization uses attitude and behavior-oriented appraisal rather than result-oriented appraisal", and "Our organization offers high

remuneration, including compensation and fringe benefits". We used the mean score of these 15 items as the value of HCWS. The Cronbach's  $\alpha$  in this study was 0.90.

Taking charge was rated by the sample employees' direct supervisor using the 10-item taking charge scale developed by Morrison and Phelps [2]. Sample items included "This employee often tries to change how their job is executed in order to be more effective", "This employee often tries to bring about improved procedures for the work unit or department", and "This employee often makes constructive suggestions for improving how things operate within the organization" (1 = strongly disagree, 5 = strongly agree). We used the mean score of these 10 items as the value of taking charge. The Cronbach's  $\alpha$  in this study was 0.93.

We asked the sample employees to rate their perception of work engagement using the 13-item work engagement scale developed by May et al. [50]. Sample items included "Performing my job is so absorbing that I forget about everything else", "I get excited when I perform well at my job", and "I exert a lot of energy performing my job" (1 = strongly disagree, 5 = strongly agree). We used the mean score of these 13 items as the value of work engagement. The Cronbach's  $\alpha$  in this study was 0.74.

We asked the sample employees to evaluate their feeling of impact using the three-item impact subscale of the psychological empowerment scale that was developed by Spreitzer [47]. The three items were "My impact on what happens in my department is large", "I have a great deal of control over what happens in my department", and "I have significant influence over what happens in my department" (1 = strongly disagree, 7 = strongly agree). We used the mean score of these three items as the value of impact. The Cronbach's  $\alpha$  in this study was 0.95.

We controlled for the sampled employees' age, gender, tenure, and education level, which were found to be related to employees' taking charge behaviors [2,51]. We also controlled for the employees' perception of organizational identification to rule out its influence on taking charge [13]. We used a five-item scale of organizational identification developed by Smidts et al. [52]. Sample items included "I feel strong ties with my organization", "I experience a strong sense of belonging to my organization", and "I feel proud to work for my organization" (1 = strongly disagree, 5 = strongly agree). We used the mean score of these five items as the value of organizational identification. The Cronbach's  $\alpha$  in this study was 0.93. Note that we included these variables as controls based on theory. The results were similar without adding any control variables.

### 3.3. Analytical Strategy

Given our multilevel conceptual model and the nested data structure, we used hierarchical linear modeling (HLM) [53] in HLM 6.08 software to test the proposed hypotheses. We also conducted a chi-square test to evaluate whether it was appropriate to use HLM analysis. The chi-square test showed that significant between-group variance existed for taking charge ( $\chi^2$  [95] = 420.94.18,  $p < 0.001$ ; ICC [1] = 0.47) and justified the usage of HLM analysis. To help interpret the findings, we group-mean centered the level 1 predicting variables and control variables (except gender, which was a dummy variable) to obtain the unbiased estimates [54]. We also used the Monte Carlo approach of re-sampling to obtain the confidence intervals for the moderated indirect effects (Hypothesis 4).

## 4. Results

### 4.1. Preliminary Analysis

Given the nested data structure, before conducting hypotheses testing, we firstly conducted a set of multilevel confirmatory factor analyses (MCFAs) using Mplus 7 software (Muthén & Muthén) to examine whether our focal variables were distinct from each other. Since only work engagement, impact, and organizational identification were rated by the employees, we only needed to evaluate the discriminant validity of these three variables. Following prior research on work engagement [50], we categorized the 13 items measuring work engagement into three parcels representing the three subdimensions of cognitive engagement, emotional engagement, and physical engagement.

The results of MCFA showed that the hypothesized three-factor model displayed a satisfactory fit ( $\chi^2 = 130.28$ , degrees of freedom (df) = 41,  $p < 0.001$ , CFI = 0.95, TLI = 0.94, RMSEA = 0.08, SRMR<sub>(within)</sub> = 0.05, SRMR<sub>(between)</sub> = 0.00). The three-factor fit the data better than the alternative models: (1) the two-factor model, in which the correlation of work engagement and impact was set to 1 (CFI = 0.74, TLI = 0.67, RMSEA = 0.18, SRMR<sub>(within)</sub> = 0.17, SRMR<sub>(between)</sub> = 0.00; Satorra–Bentler scaled  $\chi^2$ -difference (2) = 1210.08,  $p < 0.001$ ); and (2) the two-factor model, in which the correlation of work engagement and organizational identification was set to 1 (CFI = 0.86, TLI = 0.82, RMSEA = 0.13, SRMR<sub>(within)</sub> = 0.09, SRMR<sub>(between)</sub> = 0.00; Satorra–Bentler scaled  $\chi^2$ -difference (2) = 183.61,  $p < 0.001$ ). To summarize, the results of MCFA indicated that our focal variables had good discriminant validity. The descriptive statistics and correlations of all the variables are presented in Table 1.

**Table 1.** Descriptive statistics and correlations of variables. HCWS: high-commitment work systems.

Variable.	Mean	SD	Correlations									
			1	2	3	4	5	6	7	8	9	
1. Age	31.37	7.14	—									
2. Gender	0.57	0.50	0.20***	—								
3. Tenure	5.83	5.41	0.73***	0.02	—							
4. Education level	2.66	0.67	−0.13*	−0.20***	0.08	—						
5. Organizational identification	3.73	0.87	0.07	−0.01	0.10	0.09	(0.93)					
6. HCWS	4.32	1.34	−0.12*	−0.06	−0.11*	0.08	0.17***	(0.90)				
7. Work engagement	3.68	0.53	−0.05	−0.13*	0.04	0.14**	0.52***	−0.02	(0.74)			
8. Impact	4.06	1.46	0.00	0.01	0.05	0.11*	0.47***	0.14**	0.27***	(0.95)		
9. Taking charge	3.42	0.77	−0.04	−0.07	0.04	0.12*	0.27***	0.23***	0.22***	0.25***	(0.93)	

Note:  $N = 352$  at the individual level and  $N = 96$  at the organizational level; Reliabilities (Cronbach's  $\alpha$ ) are in parentheses on the diagonal; \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . We used a seven-point Likert scale to measure HCWS and impact (1 = strongly disagree, 7 = strongly agree); we used a five-point Likert scale to measure taking charge, work engagement, and organizational identification (1 = strongly disagree, 5 = strongly agree).

#### 4.2. Hypotheses Testing

Table 2 presents the HLM results. As seen in Model 4 of Table 2, in this study, HCWS was positively related to the employees' taking charge behaviors ( $B = 0.19$ ,  $SE = 0.07$ ,  $p < 0.01$ ). Thus, Hypothesis 1 was supported. As shown in Model 2 of Table 2, HCWS was positively related to the employees' work engagement ( $B = 0.09$ ,  $SE = 0.04$ ,  $p < 0.05$ ). Hence, Hypothesis 2 was supported. Model 5 of Table 2 shows that the interaction term of work engagement with impact was positively related to the employees' taking charge behaviors in this study ( $B = 0.10$ ,  $SE = 0.04$ ,  $p < 0.05$ ). Thus, Hypothesis 3 was supported. We followed Aiken and West [55] to plot the interaction effect (Figure 2). Simple slope analysis showed that work engagement was positively related to taking charge when the employees felt a high level of impact (simple slope = 0.28,  $p < 0.001$ ). However, work engagement was not related to taking charge when the employees had a low-level feeling of impact (simple slope = −0.02, n.s.). Hence, Hypothesis 3 was further supported.



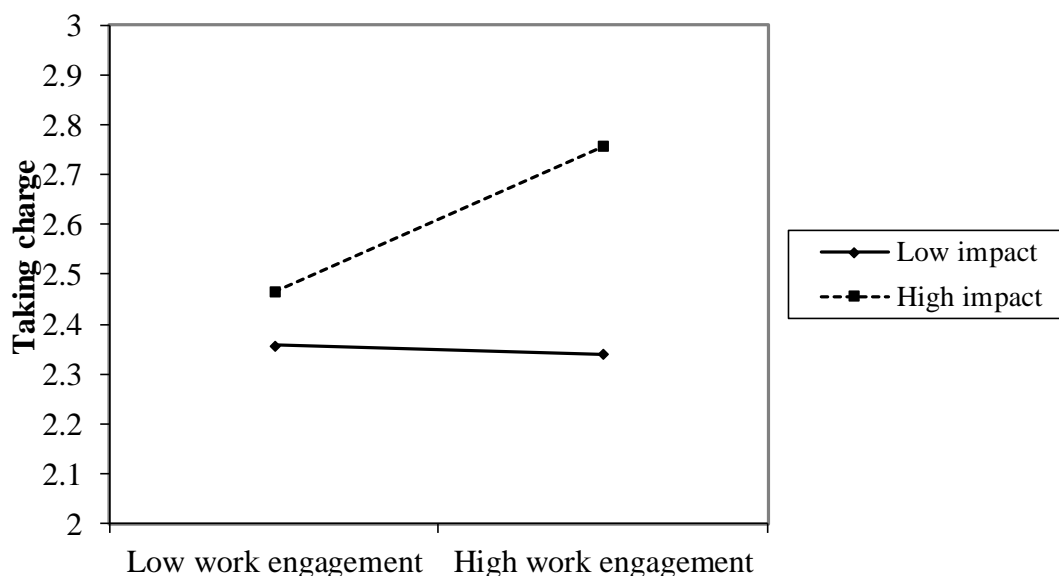


Figure 2. The interactive effect of work engagement with impact on taking charge.

Table 2. HLM results. HLM: hierarchical linear modeling.

Variable	Work Engagement				Taking Charge					
	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Intercept	3.68***	0.05	3.29***	0.18	3.44***	0.08	2.55***	0.30	2.48***	0.29
Control variables										
Age	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01
Gender	−0.00	0.05	−0.00	0.05	−0.04	0.08	−0.04	0.07	−0.07	0.07
Tenure	−0.01	0.01	−0.01	0.01	−0.00	0.01	−0.00	0.01	−0.01	0.01
Education level	0.01	0.04	0.01	0.04	0.07	0.07	0.07	0.07	0.03	0.07
Organizational identification	0.22***	0.04	0.22***	0.04	0.14	0.08	0.15	0.08	0.07	0.07
Predictors										
HCWS			0.09*	0.04			0.19**	0.07	0.21**	0.06
Work engagement									0.13	0.09
Impact									0.09*	0.04
Interaction effects										
Work engagement × Impact									0.10*	0.04
Model deviance	457.26		455.60		747.81		738.90		720.25	

Note:  $N = 352$  at the individual level and  $N = 96$  at the organizational level; \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

To test Hypothesis 4, we followed the procedures introduced by Zhang et al. [56]. First, we calculated the estimate of Path A (i.e., the relationship between HCWS and work engagement). Second, we estimated the simple slopes and standard errors for work engagement in predicting taking charge (i.e., Path B) under two conditions: among employees who felt a high versus low level of impact. Third, we calculated the indirect effects by multiplying Path A and Path B, and then determined the 95% confidence intervals (CIs) using the Monte Carlo approach of re-sampling. We also calculated the 95% confidence interval of the difference between the two indirect effects.

We wrote a program in R language to calculate the 95% confidence intervals of the two indirect effects and their difference [57]. Based on 20,000 re-sampling bootstrapping, the results showed that the indirect effect was significant only when the employees felt a high level of impact (indirect effect = 0.03, 95% CI = [0.001, 0.061]). The indirect effect was not significant when the employees felt a low level of impact (indirect effect = −0.002, 95% CI = [−0.024, 0.020], including zero). The difference between the two indirect effects was significant (difference = 0.03, 95% CI = [0.001, 0.064]). Hence, Hypothesis 4 was supported.

## 5. Discussion

We aimed to explore the influence of sustainable human resource management on the change-oriented behaviors of employees. The results showed that HCWS (as a typical type of

sustainable human resource management) was positively related to the employees' taking charge behaviors in this study (as a typical type of change-oriented behaviors). We found that the employees' work engagement and feeling of impact operated together in the underlying psychological mechanism of the above relationship. Specifically, HCWS affects the employees' likelihood of taking charge through work engagement only when the employees felt a high level of impact. However, HCWS could not affect the employees' likelihood of taking charge via work engagement when they had a low-level feeling of impact.

### 5.1. Theoretical Contributions

This research provides several theoretical contributions to the field of sustainable human resource management, change-oriented behaviors, and psychological processes in sustainability science. First, we advance the literature on sustainable human resource management by exploring its influence on the change-oriented behaviors of employees. Sustainable human resource management reflects the employers' purpose of pursuing long-term economic, social, and ecological goals [58]. However, the existing research on sustainable human resource management mostly focused on investigating its role in affecting individual and organizational performance [59–62], and most focused on short-term performance such as profit and revenue. The research examining the influence of sustainable human resource management on the sustainable performance of the organizations is scarce. Scholars have long called for exploring the relationship between sustainable human resource management and the long-term, future-oriented success of organizations [63,64]. A long-term and future-oriented competitive advantage is inseparable from proactive employees. However, limited research has examined the effect of sustainable human resource management on the employees' change-oriented and future-oriented behaviors. In this study, we answered the call from sustainable human resource management researchers, and found that HCWS can motivate employees to take charge.

Second, this research advances the literature on change-oriented behaviors by examining whether HCWS is an important antecedent of employees' taking charge behaviors. The existing research has investigated the influence of an individual's traits or trait-like factors (e.g., manager's openness [7]), leadership (e.g., transformational leadership [6]), motivation (e.g., role-breadth self-efficacy [7]) on taking charge. However, the research that explored the effect of organization practices, such as human resource management, on taking charge was scarce. In this research, we found that HCWS could promote employees' taking charge behaviors, and thus we extend the research of the antecedents of change-oriented behaviors such as taking charge.

Finally, we broaden the literature examining the psychological processes in sustainability science and answered the call for more research in exploring the psychological processes linking sustainable human resource management and change-oriented behaviors [16]. Similarly, researchers of sustainable human resource management suggested that we should pay more attention to the underlying mechanisms [64,65]. Specifically, we integrated the JD-R model and the proactive motivation model with the literature on sustainable human resource management in this study. We synchronously investigated the psychological process of the motivational states of "can do" and "energized to", and found that the feeling of impact could moderate the indirect effect of HCWS on employees' taking charge behaviors via work engagement. Besides, this research extends the application of proactive motivation model and JD-R model to the research field of sustainability science.

### 5.2. Practical Contributions

This research has several practical implications to practitioners. First, we suggest that employers should consider sustainable human resource management if they want to gain a long-term competitive advantage. Managers cannot handle all the problems by themselves, and they should count on their employees to be more proactive and responsible. Hence, the employees become the rare, imperfectly imitable, and non-substitutable resources of each organization in today's business world. Thus, sustainable human resource management is a necessary organization practice that can motivate

employees to enact the change and future-oriented tasks. For example, employers should provide more extensive training to employees. Besides, enlarged jobs and job rotation should be considered to increase employees' confidence in completing complex and challenging tasks. In addition, employers should offer better pay and create a work environment with egalitarianism and safety to motivate employees to work harder and put more effort into their tasks.

Second, we also found that the feeling of impact played an important moderating role in the relationship between HCWS and taking charge via work engagement in this study. Hence, we suggest that employers and managers should provide more feedback to their employees and state and reaffirm the importance of their work. Besides, managers should share authority with their employees and make them feel that they have more control in their jobs. By doing so, employees will feel that they have a high level of impact and are more likely to choose change-oriented behaviors that can benefit the sustainable performance of the organization.

### 5.3. Limitations and Future Research Directions

This study has some limitations. First, we used a cross-sectional design to collect data, which precluded us from making strong causal inferences. Although we used three sources of data (the HR manager, the employees, and the sample employees' direct supervisor), which could have eliminated the common method bias to some extent, a longitudinal design or field experimental design are encouraged to replicate our findings and enable strong causal inferences.

In addition, we only examined the effects of HCWS on the employees' taking charge behaviors in this study. Although HCWS is a typical type of sustainable human resource management, we encourage future research to explore the relationship between other types of sustainable human resource management (e.g., socially responsible human resource management [66]) and change-oriented behaviors. Moreover, we found a strong relationship between HCWS and taking charge. However, based on the proactive motivation model, we only theorized the underlying psychological mechanism of work engagement and impact in such a relationship. More research on the psychological process (e.g., felt responsibility to change) linking sustainable human resource management and change-oriented behaviors is encouraged.

Besides, the majority of our participants were mostly well educated (92.6% had an associate degree or higher). This limits the generalizability of our findings to some extent. We encourage future research to examine our research model among employees with lower levels of education (i.e., high school education or below). By broadening the research sample, we can better understand the relationship between HCWS and taking charge among employees with a low level of education, and provide more practical suggestions to prompt these employees' taking charge behaviors.

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## Declaration

### HCWS scale

1. In our organization, promotion is from within rather than from outside.
2. Our organization uses careful selection procedures in recruiting.
3. Our organization uses extensive training and socialization.
4. Our organization tries not to fire employees.
5. Our organization has enlarged jobs and job rotation.
6. Our organization uses appraisal of team performance rather than individual performance.
7. Our organization uses attitude and behavior-oriented appraisal rather than result-oriented appraisal.

8. Our organization uses feedback for development purposes rather than for evaluation purposes.
9. Our organization offers high remuneration, including compensation and fringe benefits.
10. Our organization uses extensive ownership of shares, options, or profit sharing.
11. Our organization tries to promote egalitarianism in income, status, and culture.
12. Our organization uses participation in the forms of suggestion, grievance systems, and morale survey.
13. Our organization has open communication and wide information sharing.
14. Our organization emphasizes strong overarching goals.
15. In our organization, successes of teams rather than individual are hailed.

#### **Taking charge scale**

1. This employee often tries to change how his or her job is executed in order to be more effective.
2. This employee often tries to adopt improved procedures for doing his or her job.
3. This employee often tries to bring about improved procedures for the work unit or department.
4. This employee often tries to institute new work methods that are more effective for the company.
5. This employee often tries to change organizational rules or policies that are nonproductive or counterproductive.
6. This employee often makes constructive suggestions for improving how things operate within the organization.
7. This employee often tries to correct a faulty procedure or practice.
8. This employee often tries eliminate redundant or unnecessary procedures.
9. This employee often tries to implement solutions to pressing organizational problems.
10. This employee often tries to introduce new structures, technologies, or approaches to improve efficiency.

#### **Work engagement scale**

1. Performing my job is so absorbing that I forget about everything else.
2. I often think about other things when performing my job.
3. I am rarely distracted when performing my job.
4. Time passes quickly when I perform my job.
5. I really put my heart into my job.
6. I get excited when I perform well on my job.
7. I often feel emotionally detached from my job.
8. My own feelings are affected by how well I perform my job.
9. I exert a lot of energy performing my job.
10. I stay until the job is done.
11. I avoid working overtime whenever possible.
12. I take work home to do.
13. I avoid working too hard.

#### **Impact scale**

1. My impact on what happens in my department is large.
2. I have a great deal of control over what happens in my department.
3. I have significant influence over what happens in my department.

#### **Organizational identification scale**

1. I feel strong ties with my organization.
2. I experience a strong sense of belonging to my organization.
3. I feel proud to work for my organization.
4. I am sufficiently acknowledged in my organization.
5. I am glad to be a member of my organization.

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