

Job Crafting Promotes Internal Recovery State, Especially in Jobs that Demand Self-control: A Daily Diary Design

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Abstract

Background: There is an increasing body of research on how employees recover from work, but most of this research has focused on recovery during non-work hours (external recovery) rather than recovery during the work hours (internal recovery). Using the conservation of resources theory as a conceptual framework, we tested whether job crafting promotes internal recovery state, and examined the processes that explain this association.

Methods: Using the daily diary method, 120 participants provided information twice a day for five days by rating job crafting, ego depletion, self-control demands at work, fatigue and vigor.

Results: The analysis of results showed that after controlling for fatigue and vigor before employees started a day's work, job crafting predicted significantly better internal recovery, and this association was mediated by lower ego depletion. These associations were moderated by how much self-control was required by the job, with the links between job crafting, lower ego depletion and internal recovery being stronger for employees with high demands to exercise self-control.

Conclusions: This study provides insights to how employees with high self-control demands recover from work via job crafting.

Background

Employees need to recover from work during off-job time to stay healthy and maintain well-being [1]. Previous studies have shown that recovery occurring off-job time promotes employee well-being and better functioning at work the next day. For example, recovery is positively related to life satisfaction[2], the next day's work engagement [3-4] and task performance [5].

However, previous studies might only tell half of the story. In the literature on recovery, researchers have mainly concentrated on recovery occurring after work in non-work contexts (external recovery). However, recovery from work can start during the work day in the work context (internal recovery). This aspect of recovery has little attention from researchers. One exception is a study [6] which found that internal recovery during the work day increased the possibility that employees started their next working day in an optimally recovered state. Therefore, it is important to fill this research gap in order to facilitate employees' internal recovery even when facing high work pressures and workloads.

According to the conservation of resources (COR) theory [7-8], recovery from work occurs if employees replenish psychological, emotional and physical resources that are depleted during work, and they prevent further depletion of these resources after work. One way that recovery can be accomplished is by employees changing the demands of their job in relation to their job resources, also called job crafting [9-10]. Job crafting helps the employee gain resources and prevent the loss of resources [9-10]. In the current study we focus on the possibility that job crafting helps employees to maintain a state of internal recovery, and we explore a potential underlying mechanism and boundary condition in this relationship. Thus the study makes two main contributions to the literature.

First, to our knowledge, the effect of job crafting on internal recovery state is uncharted territory. Based on COR theory [8], we argue that by job crafting [10], employees can replenish and prevent further depletion of resources that are depleted during the workday. By maintaining adequate resources, these employees are less likely to experience ego depletion, a state in which there has been an exhaustion of resources needed to change behaviors or pursue goals [11]. In turn, lower ego depletion positively impacts internal recovery state [12]. In sum, the current study makes a contribution to the literature by empirically testing the effect of job crafting on internal recovery state, and by testing whether this association is mediated by ego depletion. The results of these analyses have implications for how employers and employees can facilitate employees' recovery after work.

Second, in line with COR's principle of the gain paradox, which proposes that resource gains become more important when resource loss circumstances are high [13], we assume that the positive effect of job crafting on internal recovery becomes more important when the individual is in high resource loss circumstances. More and more jobs are high pressure work environments that require high concentration and self-control. For most employees, self-control demands are a source of stress at work [14]. Thus, in the current study, we use self-control demands as an indicator of resource loss circumstances. We test whether job crafting has a differential effect on employee internal recovery state for employees with high or low self-control demands. Our study strengthens our understanding of how people with different levels of self-control demands at work might benefit differently from job crafting in terms of internal recovery.

In summary, our hypothesis is that job crafting will predict internal recovery; this process will occur through lower ego depletion; and this mediating effect will be moderated by self-control demands. In addition, consistent with previous studies [6], we focus on fatigue and vigor as indicators of employees' internal recovery state. Figure 1 summarizes the relationships tested in this study.

Job crafting

The Job Demands-Resource Model proposes that jobs are characterized by demands and resources. Job demands require employees' sustained effort and are related to certain costs. By contrast, job resources reduce the effect of job demands and associated costs, making it easier to achieve work goals and personal development [15]. However, researchers make a distinction between challenging and hindering job demands [16]. Specifically, challenging job demands, such as workload and time pressure, positively affect work-related outcomes [17]. Challenging demands require extra effort to meet, but they could lead to personal gain or growth when employees are able to surmount them [18]. In contrast, hindering job demands, such as role ambiguity and emotional demands, are not conducive to accomplishing work goals and hinder optimal functioning [19].

Using Job Demands-Resources Model as a framework, Tims et al [10] propose that job crafting refers to the self-initiated changes that employees make in their own job demands and job resources to attain and/or optimize their personal or work goals. Further, Tims et al [10] propose four job crafting dimensions: (1) increasing structural job resources (i.e., mobilizing job characteristics that help to achieve work goals and develop the self, such as opportunities for development, autonomy, or skill variety), (2) increasing social job resources (i.e., mobilizing job characteristics in the relational sphere, such as seeking social support, supervisory coaching, or performance feedback), (3) increasing challenging job demands (i.e., creating access to job demands that require effort but are rewarding when attained; for example, starting new projects), and (4) decreasing the hindrance of job demands (i.e., making sure one's work is less demanding, such as by ensuring the work is emotionally less intense).

Job crafting is not only a general behavior but a daily behavior [20]. Previous research showed that job crafting contributes to building resources at work such as positive affect [21-22], self-efficacy[22], work meaningfulness [23] and work engagement [24]. Further, job crafting could prevent resource loss by relieving burnout [24], decreasing exhaustion [25], and relieving negative affect [21].

Theoretical background and hypothesis development

COR theory [7-8][13] provides a theoretical foundation for understanding how job crafting affects vigor and fatigue. This theory suggests that individuals seek to gain resources such as social support, and to prevent the loss of resources such as energy. Resources such as support and energy help employees to better address environmental demands. According to COR theory, employees need to gain new resources or replenish consumed resources to recover from work.

Job crafting can potentially increase employees' important resources such as supervisor supports and social relations [10] [20] [22], and reduce resource loss such as relieving fatigue and decreasing burnout [24][26]. Thus, it is reasonable to argue that job crafting, as an important positive workplace behavior [10], can reduce various stress reactions and promote internal recovery. Below, we will use COR as the theoretical basis to develop hypotheses regarding the relationship between job crafting and an internal recovery state, as well as the mediating role of ego depletion and the moderating role of self-control demands in these associations.

Mediating effect of ego depletion

Ego depletion refers to a state in which there has been an exhaustion of resources for changing behaviors or pursuing goals [27-28]. Based on COR theory [13], individuals with greater resources are less vulnerable to exhaustion of resources. We propose that job crafting provides employees the opportunity to gain resources and reduce the loss of resources, and thus to be lower their risk of ego depletion.

Specifically, job crafting might prevent employee ego depletion in the following ways. First, employees who increase their job resources (structural job resources and social job resources) may be less likely to experience ego depletion at work. COR theory proposes that employees who possess resources are better equipped to handle stressful circumstances and are more likely to avoid problematic situations [8]. In line with this proposition, increasing structural job resources and social job resources via job crafting enables employees to handle high job demands, leading to less ego depletion. In addition, job crafting protects employees from ego depletion and allows employees to have access to larger pools of resources that will protect them from strain. For example, previous studies demonstrated that job crafting is negative related to burnout and exhaustion [24-25].

Second, we expect that increasing challenging job demands also prevents employee ego depletion. Although challenging job demands require extra resources from employees, they do not necessarily cause a decrease in resources. This is because the positive emotions, self-efficacy and personal growth provided by challenging job demands are important resources for employees [29-30]. Challenging job demands do require extra effort but do not have an energy-depleting effect [16]. For example, Crawford et al [31] found that increasing challenging job demands contributes to lower levels of burnout. Similarly, increasing challenging job demands may relieve ego depletion by building resources such as positive affect [21], self-efficacy [22], work meaningfulness [23].

Third, reducing hindering job demands may help prevent ego depletion. Hindering job demands have a strong relationship with ego depletion [15]. Decreasing hindering job demands allows employees to focus their efforts on core work tasks and to restore energy [10], which may prevent ego depletion. For example, employees may protect themselves from ego depletion via minimizing contact with people whose problems affect them emotionally. Further, previous studies revealed that decreasing hindering job demands is related to decreased burnout and exhaustion [24-25]. Taken together, this evidence leads us to we believe that employees who decrease hindering job demands via job crafting experience less ego depletion.

Previous findings provide initial support for the idea that job crafting can prevent employee resource depletion. For example, job crafting contributes to decrease burnout [24]. Similarly, Petrou et al [25] reported that job crafting was related to low exhaustion. Thus, based on the theoretical considerations and previous research, we expect that employees' daily job crafting will be negatively related to daily ego depletion at work.

Hypothesis 1.

Daily job crafting will be negatively related to daily ego depletion at work.

COR theory proposes that individuals who have fewer resources are more vulnerable to further resource loss and less capable of resource gain [13]. In line with the proposition, employees who experience ego depletion at work have fewer resources to deal with any additional job demands and thus experience high fatigue and low vigor at the end of workday. For example, if employees are in the state of depletion at work, they would find subsequent job tasks more demanding and need more resources to overcome non-task distractions. In turn, employees have few resources left at the end of the workday and feel more fatigue and less vigor.

There is some initial evidence that supports the above view. Researchers have demonstrated that self-regulatory resource depletion induced by self-control negatively predicts end-of-day vigor and positively predicts end-of-day fatigue [6]. Similarly, Lanaj et al [12] found that morning depletion diminished employees' daily vigor. Taken together, these results suggest that there are conceptual and empirical reasons to predict that employees who experience ego depletion will feel more fatigue and less vigor at the end of the workday.

Hypothesis 2.

Daily ego depletion will be negatively related to end-of-day vigor (2a) and positively related to end-of-day fatigue (2b).

Combining the aforementioned arguments about the relationships between daily job crafting and daily ego depletion, and between daily ego depletion and vigor and fatigue at the end of workday, it might be expected that daily ego depletion would be a mediator in the relationship between job crafting at work and the resources available after work. In terms of COR theory, job crafting is a resource-gaining experience; the gain in resources lowers the risk of ego depletion and allows the employee to deal with additional job demands; and the employee has sufficient resources left at the end of the day. Based on this argument, we believe that the relationship between daily job crafting and vigor and fatigue at the end of workday is mediated by daily ego depletion.

Hypothesis 3.

Daily ego depletion will mediate job crafting's association with (3a) vigor and (3b) fatigue at the end of workday.

Moderating effect of self-control demands

Self-control demands require employees to control their impulses (inhibiting spontaneous, impulsive response tendencies), resist distractions (resisting distractions evoked by task-irrelevant stimuli) and overcome inner resistance (overcoming inner dislikes, aversions or motivational inhibitions) [32]. Previous studies demonstrated that when employees encounter more self-control demands, they are more likely to experience a depletion of limited self-control resources [27-28].

The gain paradox principle of COR theory proposes that resource gains become more important in the context of resource loss [13]. In line with this principle, employees who experience high self-control demands benefit most from job crafting as a way to reduce ego depletion. Compared to employees with low self-control demands, employees who encounter high self-control demands are more likely to experience resource loss [33] and job crafting becomes more important for them. Consequently, employees with high self-control demands are more likely to engage in job crafting to change the level of job demands in relation to job resources, thus reducing ego depletion. On the basis of the aforementioned discussion, we proposed the following moderation hypothesis.

Hypothesis 4.

Self-control demands will moderate the negative relationship between job crafting and ego depletion, with the relationship being stronger when self-control demands are high.

Combining our previous two hypotheses on mediation and moderation, we also proposed the following moderated mediation hypothesis.

Hypothesis 5.

Self-control demands will moderate the indirect effect of job crafting on (5a) vigor and (5b) fatigue at the end of workday through ego depletion, with the indirect effect being stronger when self-control demands are high.

Method

Participants and procedure

We recruited 170 employees from various organizations in China to participate in a 5-day diary study. Of the 170 employees who agreed to participate, 151 (88.82%) actually took part. Data from 31 participants had to be removed because they completed the daily questionnaire on fewer than three days. In the final sample of 120 employees, the average age was 29.19 years old ($SD = 5.63$) and the average years of tenure at the current job was 6.13 ($SD = 6.99$). Forty nine participants were male, and seventy one participants were female. Most held a college degree (57.5%) or a graduate degree (36.7%), and a small number held a high school degree (5.8%).

Participants were approached through the social networks of research assistants involved in this study. Participants were informed the purpose of the study, the implications of participating in the study, and the fact that participation was anonymous and voluntary. After agreeing to take part, they received information about the study procedure and a link to a web-based general questionnaire; the questionnaire asked about demographics and self-control demands. The next week, they started to complete daily questionnaires twice a day for a period of 5 consecutive workdays. Each day for five days, research assistants sent a link to a web-based questionnaire through WeChat about 1 hr before the requested completion time (when getting up in the morning before work and at the end of the workday). The morning questionnaire assessed fatigue and vigor before work. The evening questionnaire assessed fatigue and vigor after work, daily job crafting, and daily ego depletion.

Each participant received 10 Chinese Yuan (approximately 1.4 US dollars) after completing the questionnaire every day. Participants provide informed consent. The present study received the university's research ethics committee's approval and the confidentiality of participants' responses was guaranteed.

Measures

We used the translation and back-translation method to translate the scales that were originally in English into Chinese. Specifically, scales in English (job crafting, ego depletion, fatigue, vigor and self-control demands) were first translated into Chinese by a PhD student who was fluent in both English and Chinese. The Chinese versions of the scales were then back-translated into English by another PhD student who was also fluent in Chinese and English.

Daily job crafting.

Daily Job crafting was assessed using the 10-item Job Crafting Questionnaire developed by Petrou and his colleagues [20]. The measure includes three subscales: seeking resources (4 items, e.g., "Today, I asked colleagues for advice"),

seeking challenges (3 items, e.g., "Today, I asked for more tasks if I finished my work"), and reducing hindering demands (3 items, e.g., "Today, I made sure that my work was mentally less intense"). Each item was scored on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), with high scores indicating high job crafting behavior. In the current study, the Cronbach's alpha of the full scale was 0.83.

Daily ego depletion.

To measure daily ego depletion, we used the five-item Daily Ego Depletion Scale developed by Bertrams et al [34], based on the definition of ego depletion proposed by Muraven and Baumeister [28]. One sample item is "At the moment, I feel like my willpower is gone." Each item is rated on a 4-point Likert scale (1 = not at all, 4 = a great deal). The responses were averaged across the five items, with higher scores indicating higher ego depletion. In the current study, the Cronbach's alpha of the scale was 0.90.

Daily recovery indicators.

Fatigue and vigor were each measured with five items derived from the Mood State Scale [35]. Each item was rated on a 5-point scale (1 = not at all, 5 = very much). Example items are "Now, I feel fatigued" (for fatigue; mean Cronbach's alpha across the workweek = 0.71 for the end-of-workday questionnaire) and "Now, I feel vigorous" (for vigor; mean Cronbach's alpha across the workweek = 0.95 for the end-of-workday questionnaire).

Self-control demands.

Self-control demands were assessed using the 15-item Self-Control Demands Scale, which includes three subscales [32]. The three subscales are impulse control (6 items, e.g., "My job requires me never to lose my temper"), resisting distractions (4 items, e.g., "In order to achieve my performance goals, I must not let myself be distracted"), and overcoming inner resistances (5 items, e.g., "Starting on certain tasks sometimes requires that I use a lot of willpower"). Each item was scored on a 5-point Likert scale (1 = not at all, 5 = a great deal). The responses were averaged across the 15 items, with higher scores indicating higher self-control demands. In the current study, the Cronbach's alpha of the scale was 0.86.

Control variables.

A previous study demonstrated gender and age differences in indicators of recovery [36]. Therefore, we chose gender (male = 1; female = 0) and age (in years) as control variables in the statistical analyses. In addition, we controlled for the daily morning ratings of fatigue and vigor. It is because morning fatigue and vigor affect individuals' fatigue and vigor at the end-of-workday [6].

Statistical analysis

Given that daily repeated measurements (Level 1) were nested within individuals (Level 2), we used multilevel analysis to test our hypotheses with Mplus Version 7.02 [37]. In this study, daily-level constructs were Level 1 variables (daily job crafting, daily ego depletion, daily fatigue and daily vigor; $N = 528$ study occasions), whereas general constructs were Level 2 variables (self-control demands; $N = 120$ participants). Daily fatigue and vigor in the morning (Level 1), and gender and age (Level 2) were entered as control variables, because these variables were significantly correlated with the indicators of internal recovery.

In the analyses, Level 1 variables were centered based on each individual's mean score to remove any possible between-individual effects. Level 2 variables were centered based on the grand mean. Specifically, we examined the effect of daily job crafting on daily ego depletion (Hypothesis 1), the effect of daily ego depletion on fatigue and vigor at the end of the workday (Hypothesis 2), and the mediating effect of ego depletion in the relationship between job crafting and fatigue and vigor at the end of the workday (Hypothesis 3). Furthermore, we tested the moderated mediation effect, specifically the moderating role of self-control demands in the indirect effect of job crafting on fatigue and vigor at the end of the workday through ego depletion (Hypothesis 4, 5).

Results

Preliminary analyses

First, we calculated the means, standard deviations, and correlations among all variables. Results showed that job crafting was positively related to vigor at the end of the workday ($r = 0.34, p < 0.001$), and negatively related to fatigue at the end of the workday ($r = -0.17, p < 0.05$), and ego depletion ($r = -0.21, p < 0.01$). Additionally, ego depletion was negatively related to vigor at the end of the workday ($r = -0.27, p < 0.001$), and positively related to fatigue at the end of the workday ($r = 0.75, p < 0.001$). These results provided preliminary support for our Hypotheses.

Then, to examine whether variables in the study varied within individuals, we tested a null model that included only the intercept to calculate intraclass correlations (ICC) for each variable. As shown in Table 1, for job crafting, 60% of the variances were at the within-person level; for ego depletion, 68% of the variances were at the within-person level; for fatigue_(end of work-day), 63% of the variances were at the within-person level; for vigor_(end of work-day), 83% of the variances were at the within-person level. Therefore, it was appropriate to use a multilevel approach to test our hypotheses.

Table 1

Means, Standard Deviations, and Correlations among Study Variables

Variable	<i>M</i>	<i>SD</i>	ICC	1	2	3	4	5	6	7	8	9
Between-person level												
1.Gender	0.61	0.49	—	—								
2.Age	29.19	5.63	—	0.05	—							
3.Self-control demands	3.56	0.55	—	0.03	— 0.16	—						
Within-person level												
4. Job crafting	3.46	0.68	0.40	0.10	— 0.19	0.34**	—					
5. Ego depletion	2.43	0.92	0.32	0.15	— 0.04	0.47**	— 0.21**	—				
6. Fatigue _(end of work-day)	2.57	1.06	0.37	0.11	0.16	0.14	— 0.17*	0.75***	—			
7. Vigor _(end of work-day)	3.48	0.64	0.17	— 0.35*	0.17	0.03	0.34***	— 0.27***	— 0.36***	—		
8. Fatigue _(morning)	2.34	1.02	—	— 0.56	0.32	— 0.13	0.05	—0.04	—0.06	0.06	—	
9. Vigor _(morning)	3.10	0.90	—	0.23	0.12	— 0.33	—0.04	0.01	—0.01	— 0.04	— 0.50***	—

Note. *N* = 120 (between-person level); 528 (within-person level). **p* < 0.05, ***p* < 0.01, ****p* < 0.001.

Hypothesis testing

Table 2 shows that after the control variables were entered, daily job crafting positively predicted daily ego depletion ($B = -0.25$, $SE = 0.11$, $p < 0.05$). Daily ego depletion positively predicted fatigue at the end of workday ($B = 0.71$, $SE = 0.05$, $p < 0.001$) and negatively predicted vigor at the end of workday ($B = -0.15$, $SE = 0.05$, $p < 0.01$). The indirect effect of daily job crafting on fatigue at the end of workday via daily ego depletion was significant (indirect effect = -0.18, with a 95% CI [0.01, 0.07]). The indirect effect of daily job crafting on vigor at the end of workday via daily ego depletion was significant (indirect effect = 0.05, with a 95% CI [0.01, 0.07]). These results support Hypotheses 1, 2, and 3.

Table 2

The indirect effect of daily ego depletion on the relationship between job crafting and fatigue and vigor at the end of the workday

Variable	Ego depletion		Fatigue _(at the end-of-workday)		Vigor _(at the end-of-workday)	
	B	SE	B	SE	B	SE
Between-person level						
Gender	0.06	0.11	0.15	0.14	-0.13*	0.06
Age	0.01	0.02	0.01	0.02	0.01	0.01
Within-person level						
Job crafting	-0.25*	0.11	-0.02	0.05	0.33***	0.05
Ego depletion			0.71***	0.05	-0.15**	0.05
Fatigue _(morning)	-0.05	0.04	-0.05	0.04	0.01	0.03
Vigor _(morning)	-0.03	0.05	-0.02	0.04	-0.01	0.03

Note. N = 120 (between-person level); 528 (within-person level); *p < 0.05, **p < 0.01, ***p < 0.001.

Hypothesis 4 predicted that self-control demands would moderate the relationship between job crafting and ego depletion, such that the relationship would be stronger for employees have jobs required high self-control. As shown in Table 3, after entering the control variables, the interaction between job crafting and self-control demands negatively predicted ego depletion ($B = -0.23$, $SE = 0.12$, $p < 0.05$). Simple slopes analyses showed that the effect of job crafting on ego depletion was stronger for employees with high self-control demands ($B_{\text{simple}} = -0.46$, $p < 0.01$) than those with low self-control demands ($B_{\text{simple}} = -0.25$, $p < 0.05$; see Figure 2). Therefore, Hypothesis 4 was supported.

Hypothesis 5a predicted that self-control demands would moderate the indirect effect of job crafting on vigor at the end of workday through ego depletion. Results showed that the moderated mediation effect was significant ($B = 0.28$, 95% CI [0.03, 0.53], $p < 0.001$). Specifically, results showed that the indirect effect of job crafting on vigor at the end of workday through ego depletion was stronger for employees with high self-control demands ($B = 0.35$, 95% CI [0.13, 0.56], $p < 0.05$) than for those with low self-control demands ($B = 0.07$, 95% CI [0.02, 0.12], $p < 0.05$). Therefore, Hypothesis 5a was supported.

Hypothesis 5b predicted that self-control demands would moderate the indirect effect of job crafting on fatigue at the end of workday through ego depletion. Results showed that the moderated mediation effect was not significant ($B = -0.09$, 95% CI [-0.23, 0.06], $p = 0.32$). Specifically, for employees with high self-control demands, the indirect effect of job crafting on fatigue at the end of workday through ego depletion was -0.33 (95% CI [-0.47, -0.18], $p < 0.05$). For employees with low self-control demands, the indirect effect of job crafting on fatigue at the end of workday through ego depletion was -0.24 (95% CI [-0.40, -0.08], $p < 0.001$). Therefore, Hypothesis 5b was not supported.

Variable	Regression results for moderated meditation effect					
	Ego depletion		Fatigue _(at the end-of-workday)		Vigor _(at the end-of-workday)	
	B	SE	B	SE	B	SE
Between-person level						
Gender	0.09	0.12	0.16	0.14	-0.14	0.07
Age	0.01	0.01	0.01	0.01	0.00	0.01
Self-control demands	0.15*	0.05				
Within-person level						
Job crafting	-0.33**	0.10	-0.03	0.05	0.28***	0.06
Ego depletion			0.71***	0.05	-0.15**	0.05
Fatigue _(morning)	-0.04	0.04	-0.05	0.05	0.01	0.03
Vigor _(morning)	-0.02	0.05	-0.02	0.04	-0.01	0.03
Cross-level interaction						
Job crafting × Self-control demands	-0.23*	0.12				

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Discussion

Drawing on COR theory [7-8] [13], the present study examined the mediating effect of daily ego depletion in the relationship between daily job crafting and internal recovery state (vigor and fatigue at the end of day), and the moderating effect of self-control demands, using a daily diary method. Our results showed that daily ego depletion mediated the effect of daily job crafting on employee vigor and fatigue at the end of day. Moreover, self-control demands affected these indirect effects. Specifically, the indirect effect was stronger for employees with high self-control demands than employees with low self-control demands. This study demonstrates that positive work behavior (job crafting) is crucial for internal recovery from work.

Contributions to the literature

Our findings contribute to research on recovery from work and to research on job crafting in several ways. First, we extend research on the recovery from work by testing how to promote internal recovery. This issue is important because employees spend a third to a half of their day at the workplace and they have little time to participate in recovery activities during non-work time. Furthermore, organizations have a greater opportunity to influence employees' internal recovery than external recovery[38].

However, most research has focused on how to promote external recovery [39], paying little attention to the question of how to enhance employees' internal recovery state. The small number of studies on promoting internal recovery have found that work pleasure[40-41] and work engagement [4] are associated with better recovery. Our study contributes to this small body of research by examining the positive effect of daily job crafting on employees' daily internal recovery

state. The findings showed that daily job crafting positively predicts employee end-of-day vigor, and negatively predicts employee end-of-day fatigue. Thus, we are among the first researchers to address work-related factors affecting employees' internal recovery state, instead of off-job factors influencing external recovery. Our findings highlight the value of COR theory as a conceptual framework for studying the benefits of job crafting for daily internal recovery.

Second, our study contributes to an understanding of why job crafting is associated with employees' internal recovery state, by examining the mediating effect of ego depletion in the relationship. Our findings suggest that daily job crafting can reduce resource depletion by increasing social and structural resources and decreasing hindering job demands. Because these resources lower ego depletion, employees will go on to possess even more resources and lose fewer resources [7]; thus, they will have more resources at the end of workday and experience more vigor and less fatigue. Our findings extend our understanding of the potential mediating role of ego depletion in the relationship between job crafting and internal recovery state from a resource perspective.

Third, the present study examined self-control demands as a potential boundary condition of the relationship between job crafting and internal recovery state. We found that the effect of job crafting on internal recovery state through ego depletion was stronger for employees with high self-control demands. Those results are consistent with the proposition from COR theory that resource gains become more important for individuals who are in the context of resource loss [13]. When there are stronger demands for employee self-control, they might deplete employees' limited resources [28]. In turn, employees who have fewer resources are more likely to benefit from job crafting and experience less ego depletion, leading to lower fatigue and higher vigor at the end of work. Further, our findings are consistent with previous research results showing that employees who are coping well with self-control demands profit from high situational control opportunities at work [42].

Finally, the present study contributes to a broader understanding of the effects of job crafting. Studies on job crafting have primarily focused on its effect on employees' work-related outcomes, such as increasing job satisfaction[43], enhancing job performance [44], and reducing turnover intention [45]. However, the potential positive effects of job crafting on employee non-work-related outcomes have been largely overlooked. Our study found that people who are able to craft their jobs have a higher recovery state at the end of the workday, helping us gain more understanding on the effects of job crafting on employees.

In addition, the present study used a within-person daily diary method that can capture more dynamic and short-term relationships between job crafting and its outcomes. The daily diary method has been used to document the positive effects of daily job crafting on work-related outcomes [46-47]. Adding to the limited number of daily studies on job crafting, our study found that daily job crafting was negatively related to daily ego depletion and end-of-day fatigue, and positively related to end-of-day vigor. Those results provide a more holistic picture of how job crafting might be related to an internal recovery state within a short-term time period.

Practical implications

The current study has several potential practical implications. First, the findings showed that daily job crafting was significantly related to end-of-day vigor and fatigue, thus suggesting that intervening to help employees do more job crafting could be beneficial. Previous studies have suggested that job crafting interventions are effective in helping employees to adapt their job demands and job resources [48-50], and they can enhance work engagement [50], improve job performance[51] and increase job resources [22]. Thus, we suggest that job crafting interventions can be a potential way for employees to promote their internal recovery state. Specific intervention steps are described by Van den Heuvel et al. [22]. These include exercises and goal setting aimed at increasing social job resources, increasing challenging job demands, increasing structural job resources, and decreasing hindering job demands.

Second, our results showed that ego depletion mediates the relationship between job crafting and internal recovery state. Therefore, in addition to providing job crafting interventions, organizations may provide additional resources to boost the internal recovery of employees who are more likely to experience ego depletion. One way that organizations could decrease employees' ego depletion would be meeting employees' basic psychological needs at work. For example, given that mindfulness is positively related to basic psychological needs [52], managers may provide mindful intervention to meet employees' psychological needs.

Finally, the results of the present study suggest that the indirect effect of job crafting on internal recovery is different for employees with different levels of self-control demands. Because employees with high self-control demands are more likely to be in the state of resource depletion [27] [33], they might be able to promote internal recovery by balancing the relationship between job resources and job demands. However, employees with low self-control demands might benefit less from job crafting. This group might benefit more from other avenues of attaining recovery from job demands. For example, they could take micro-breaks at work or a longer lunch break [53-54].

Limitations and future research

There are several limitations of the present study that need to be addressed in future research. First, the data were all collected with self-report questionnaires, which may raise concerns about common method variance. However, in our study, some potential person-level sources of common method variance (e.g., self-control demands) were controlled using a within-person design. In addition, most of the variables of interest in the present study (e.g., ego depletion, vigor, fatigue) concern individuals' own feelings, making them difficult to measure without self-report. Nevertheless, it will be beneficial in future studies to collect data from different sources (e.g., supervisors) to replicate our findings. For example, employees' supervisors or colleagues might be able to report employees' job crafting behavior.

Second, the current study focused on the relationship between job crafting and internal recovery, but did not control for the effects of internal recovery activities (e.g., micro-breaks at work, restive lunch breaks, etc.). Previous studies have suggested that employees who self-initiate micro-breaks at work experience higher vigor and lower fatigue [55-56]. Therefore, future research should control for these self-help activities in order to examine the unique effect of job crafting on internal recovery.

Finally, we tested only employees' self-control demands as a moderator of the relationship between job crafting and internal recovery. Previous studies have demonstrated that perceived organizational support also has an important effect on the relationship between job crafting and employees' attitudes and behavior [57]. Similarly, perceived organizational support may play a crucial contextual role in the relationship between job crafting and internal recovery. Therefore, further research may examine whether high perceived organizational support could reinforce the association between job crafting and internal recovery.

Conclusions

In the present study, we examined the relationship between job crafting and employee internal recovery state, as well as the mediating role of ego depletion and the moderating role of self-control demands on a daily basis. We found that job crafting predicts fatigue and vigor at the end of workday through employees' ego depletion. This mediation relationship was stronger for employees with high self-control demands. The current study is an important step forward in examining how positive work behavior such as job crafting affects employees' internal recovery from work. Moreover, this study provides insights to how employees with high self-control demands recover from work.

Declarations

Ethics approval and consent to participate

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The Ethics Committee of the School of Psychology, Central China Normal University has approved the study. A written informed consent is obtained from each participant. A informed consent to participants includes the purpose of the study, the implications of participating in the study, and the fact that participation was anonymous and voluntary.

Consent for publication

Not applicable

Availability of data and materials

Data is available from the first author on reasonable request (Yanwei Shi, Email: syw@shnu.edu.cn).

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

YwS wrote the manuscript. YwS and ZS conceived the research idea. DL and HZ provided major initial criticism of the manuscript. KhN secured funding for the project. All authors read and approved the final manuscript.

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Figures

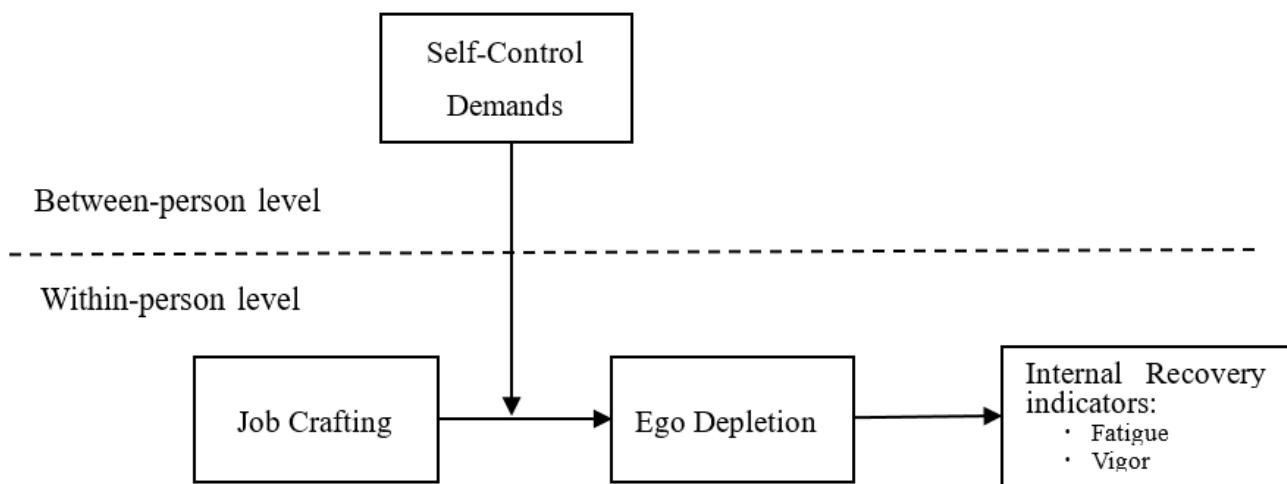


Figure 1

Proposed research model.



Figure 2

Cross-level moderating effect of self-control demand on the relation between job crafting and ego depletion