

Validation of the Japanese Version of the Recovery Experience Questionnaire

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Abstract: Validation of the Japanese Version of the Recovery Experience Questionnaire: Akihito SHIMAZU, et al. Department of Mental Health, The University of Tokyo, Graduate School of Medicine—Objectives:

The aim of this study was to validate the Japanese version of the Recovery Experience Questionnaire (REQ-J), which assesses how individuals unwind and recuperate from work during leisure time (i.e., psychological detachment, relaxation, mastery and control).

Methods: The translated and back-translated REQ was administered via the Internet to 2,520 Japanese employees from various occupations. Exploratory and confirmatory factor analyses were conducted to evaluate factorial validity. The relationship with potential predictors and consequences of recovery experiences were investigated to evaluate construct validity. Internal consistency was examined to evaluate its reliability.

Results: A series of confirmatory factor analyses revealed that the hypothesized four-factor model fit the data best. Construct validity was generally supported by expected correlations of recovery experiences with possible predictors and consequences. Cronbach's alpha coefficient for each of the four subscales was sufficient (0.85–0.89). **Conclusions:** This study confirmed that the REQ-J is an adequate measure of recovery experiences that can be used in the Japanese context. (J Occup Health 2012; 54: 196–205)

Key words: Health, Japanese, Job stress, Performance, Recovery, Work engagement

During recent years, employees have been experiencing substantial changes in working conditions, as

traditional boundaries between work and personal life are becoming increasingly blurred¹. Communication technology provides the opportunity to complete one's work outside the traditional office and beyond traditional work hours^{2,3}. These changes necessitate a better understanding of not only how employees spend their working time (i.e., on-job experiences) but also how they spend their leisure time (i.e., off-job experiences). The current article focuses on employees' recovery experiences during off-job time and examines the psychometric properties of the Japanese version of the Recovery Experience Questionnaire⁴ (REQ-J)- a self-report questionnaire to measure recovery experience.

Recovery and recovery experiences

The *recovery* process can be described as a process contrary to the strain process. To recover indicates that an individual's functional systems that have been taxed during a stressful experience return to their prestressor levels⁵. Recovery implies that affective states become more positive and that performance capabilities that have been negatively affected improve. Recovery often goes hand in hand with a decrease in physiological and psychological strain⁴.

Sonnentag and Fritz⁴ argue that "it is not a specific activity per se that helps to recover from job stress" (p.204). These authors propose that the activity's underlying attributes (i.e., so-called *recovery experiences*) are critical for recovery. Thus, two individuals may engage in two different activities, such as yoga versus taking a bath, but the underlying attributes that ultimately lead to recovery (i.e., the relaxation experienced while practicing yoga or taking a bath) might be identical for the two activities⁶. Sonnentag and Fritz⁴ explained that to gain a better understanding of the recovery phenomenon, it is necessary to go beyond specific leisure-time activities and examine the

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underlying psychological experiences instead. To this end, they developed the REQ, which captures the core functional aspects of recovery experiences, that is, psychological detachment, relaxation, mastery experiences and control.

Psychological detachment from work refers to an individual's experience of being away from the work situation⁷. When psychologically detaching from work, one is not only physically away from one's job but also temporally gains mental distance from it ("switching off") and avoids thinking about work-related topics or problems⁸. By psychologically detaching oneself from work during off-job time, the demands imposed on the functional systems during work are reduced⁴. Hence, an individual's affective or self-regulatory resources are no longer taxed and can be restored instead⁹.

Relaxation is characterized by a state of low activation and is associated with positively toned affect¹⁰. Relaxation can occur when no further demands are imposed on the individual and when little or no physical or mental effort is required¹¹. Relaxation experiences and the associated state of low activation with positive affect are important for recovery. This is because (1) a decrease in activation can stop the strain process by which job stressors translate into health impairments¹² and (2) positive affective states can undo the effects of negative affect¹³.

Mastery experiences during leisure time originate from off-job activities that are challenging, stimulate learning and provide a sense of achievement⁴. These experiences are associated with feelings of competence and proficiency. Although engagement in activities that foster mastery experiences often necessitates effort investment, mastery experiences are assumed to enable recovery from previous strains and should help gain new resources that facilitate improved health and well-being⁴.

Finally, *control* during leisure time refers to the degree to which an individual can decide what to do, as well as when and how to do it⁴. The experience of control during leisure time may act as a resource that enhances recovery from work during off-job time. This is because it (1) satisfies the desire for control¹⁴ and (2) provides an individual the opportunity to choose specific leisure activities that he or she prefers and that may be particularly helpful for recovery to occur.

Potential predictors and consequences of recovery experience

Regarding potential predictors of recovery experiences, previous research has revealed that work characteristics, such as job demands and job control, are associated with recovery experiences. For instance,

job demands were found to have a negative relationship with psychological detachment¹⁵⁻¹⁷, relaxation^{4, 17}, mastery experiences¹⁸ and control^{4, 17}. This is because (1) when confronted with high demands at work, individuals will be more likely to constantly think about their job in order to develop solutions to difficulties originating from job demands⁴; (2) the higher level of activation caused by job demands makes it more difficult to arrive at a state of relaxation during off-job time⁴; (3) fatigue caused by job demands makes it more difficult to engage in self-regulatory processes¹⁹; and (4) high job demands leave less time available for leisure activities²⁰, which reduces the individual's control over off-job time⁴. Hence, we hypothesize that job demands have a negative relationship with all four recovery experiences.

However, the relationship of job control with recovery experiences seems to be more complex. For example, in jobs with high control, some recovery opportunities might exist even during working time²¹, in turn increasing the likelihood of detachment and relaxation at home. In addition, job control enables individuals to adopt an active approach toward their environment, which is reflected in their pursuit of learning activities²² and other proactive behaviors²³, thereby increasing the likelihood of mastery experiences at home. Moreover, job control increases the likelihood that an individual will attempt to exert control during off-job time (i.e., spill over)²⁴. However, as job control often implies the possibility and the necessity of making decisions at the same time, recovery off the job might be impaired when job control is high⁴. Sonnentag and Fritz⁴ revealed that job control was not related to psychological detachment or relaxation. Siltaloppi *et al.*¹⁷ also found no associations between job control on the one hand and psychological detachment and relaxation on the other. However, they reported that job control correlated positively with mastery and control. Hence, we hypothesize that job control has a positive relationship only with mastery and control.

As for the potential consequences of recovery experiences, several well-being variables have been examined in relation to recovery experiences. For instance, recovery experiences appear to be positively related to health, that is, to low levels of fatigue, emotional exhaustion, health complaints, depressive symptoms and sleep problems^{4, 17, 25, 26}. In addition, some studies suggest that recovery experiences are positively related to work engagement^{17, 27, 28}, which refers to a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication and absorption²⁹, and to job performance^{6, 30}. Since recovery experiences (e.g., mentally switching off from work, reducing a state of prolonged activation, pursuing challenging activi-

ties and executing control during leisure time) may contribute to the prevention of continued resource drain and restoration of resources⁶⁾, we hypothesize that they are associated with better health, work engagement and job performance. In our study, we focus on overall job performance. Note that although Fritz *et al.*²⁵⁾ revealed a curvilinear, rather than a linear, relationship between recovery experiences and job performance, the current study does not expect a curvilinear relationship. However, we will test it on an exploratory basis.

The current study

Presently, the REQ is particularly used in Western countries. Versions are available in languages such as English and German⁴⁾, Spanish³¹⁾, and Finnish¹⁷⁾. As in other countries, the concept of recovery experiences is potentially beneficial for the study and practice of well-being of Japanese workers, since the Japanese work longer than workers in other Organization for Economic Co-operation and Development (OECD) countries³²⁾ and their off-job activities therefore seem to be crucial to their well-being. Thus, in order to study and apply the concept of recovery experiences in Japan, validation of the REQ-J is a necessary first step.

This study aims to validate the REQ-J in a sample of Japanese employees from heterogeneous occupations. More specifically, we examined its factorial and construct validity and its reliability (internal consistency).

Method

Translation

First, the English version of the REQ was translated into Japanese by the first author of the current study (A.S.). Then, back-translation into English was performed by an English specialist who had not read the original items. We compared the English and back-translated versions and created a preliminary Japanese version after some corrections for words, meanings and content of each item.

Participants

This study was a part of a research project that aimed to clarify the relationship between socioeconomic status and health. Participants supplied data via the Internet. The survey was conducted among registered monitors of a survey company in Japan. A total of 13,564 monitors with occupations, who were matched in age, gender and resident area to a Japanese representative sample, were randomly invited to participate in the survey. The first 2,520 respondents were included in this study. Table 1 shows the characteristics of the respondents. The mean age of

Table 1. Means (and SDs) or frequencies (and percentages) of demographic variables of participants (N=2,520)

	N	(%)	Mean	(SD)
Age (yr)	2,520		44.4	(12.9)
Gender				
Men	1,257	(49.9)		
Women	1,263	(50.1)		
Marriage				
Yes	1,560	(61.9)		
No	960	(38.1)		
Education				
College or lower	1,376	(54.6)		
University or higher	1,144	(45.4)		
Occupation				
White collar	1,782	(70.7)		
Blue collar	738	(29.3)		
Shift work				
No	2,074	(82.3)		
Yes	446	(17.7)		
Working hours / week			37.2	(24.9)

the participants was 44.4 yr (SD=12.9). Of the participants, 49.9% were male, 61.9% were married, 45.4% had a university degree or higher, 70.7% were white collar workers and 17.7% were shift workers. The mean working time per week was 37.2 h (SD=24.9).

Consent from participants was confirmed based on their filling out the questionnaires according to the ethics code for public health research in Japan³³⁾. The procedures were approved by the ethics review board of The University of Tokyo before starting the study.

Measures

The measures and variables used in this study were (1) recovery experiences, (2) possible antecedents (i.e., job demands and job control), (3) possible consequences (i.e., psychological distress, physical complaints, work engagement and job performance) and demographic characteristics.

Recovery experiences were assessed with a preliminary Japanese version of the REQ. The items of the REQ are grouped into four subscales that reflect the underlying dimensions of recovery experience: Psychological detachment (4 items), Relaxation (4 items), Control (4 items) and Mastery (4 items). All items were scored on a five-point Likert scale ranging from 1 (do not agree at all) to 5 (fully agree). Responses for each subscale were summed and averaged to get an average score for each subscale.

Job demands were assessed using the corresponding subscale of the Brief Job Stress Questionnaire (BJSQ)³⁴⁾ consisting of 3 items: "I am asked to do an excessive

amount of work”; “My job leaves me with little time to get things done”; and “My job requires working hard.” Items were scored on a four-point Likert scale, ranging from 1 (disagree) to 4 (agree). Responses for the 3 items were summed and averaged to get an average score.

Job control was assessed using the corresponding subscale of the BJSQ³⁴) consisting of 3 items: “I have influence over the pace of my work”; “I have the freedom to decide the order and way of my work”; and “I have influence over the policies in my work unit.” Items were scored on a four-point Likert scale, ranging from 1 (disagree) to 4 (agree). Responses for the 3 items were summed and averaged to get an average score.

Psychological distress was assessed using the corresponding subscales of BJSQ³⁴), consisting of 15 items mainly reflecting fatigue, anxiety and depression. For instance, “I am tired completely”; “I feel ill at ease”; and “I feel depressed.” Each item was scored on a four-point Likert scale ranging from 1 (almost never) to 4 (almost always). Responses for the 15 items were summed and averaged to get an average score.

Physical complaints was also assessed using the corresponding subscale of BJSQ³⁴) consisting of 11 items, like “I have a pain in the back.” Each item was scored on a four-point Likert scale ranging from 1 (almost never) to 4 (almost always). Responses for the 11 items were summed and averaged to get an average score.

Work engagement was assessed with the short form of the Utrecht Work Engagement Scale (UWES)²⁹), which has been validated in Japan as well³⁵). The UWES includes three subscales that reflect the underlying dimensions of engagement: Vigor (3 items; e.g., At my job, I feel strong and vigorous), Dedication (3 items; e.g., I am enthusiastic about my job) and Absorption (3 items; e.g., I am immersed in my work). All items are scored on a seven-point Likert scale ranging from 0 (never) to 6 (always). According to the validation study of the Japanese version of the UWES³⁵), it is recommended that work engagement should be treated as a unitary construct due to high correlations among the three components. Therefore, the sum of the scores of all 9 items was used, and then the sum scores were averaged to get a average score.

Job performance was assessed using a single item from the World Health Organization Health and Work Performance Questionnaire (HPQ)³⁶). Respondents were asked to rate their overall work performance during the past four weeks on a 0–10 self-anchoring scale, in which 0 was defined as the “worst possible work performance a person could have on this job” and 10 was defined as “top work performance” on the

job. We used a single-item self-report global scale because 1) it has been argued that a global index of overall job performance (single item measure) is an inclusive and valid measure of job performance³⁶); 2) data on the objective performance of employees is difficult to obtain; and 3) alternative self-reported measures of job performance focus on single occupations and include questions tailored to the unique demands of those occupations.

Demographic variables, such as gender, marriage, education, occupation, shift work and working hours per week, were included as possible confounders in the analyses.

Analyses

In evaluating factorial validity, we first conducted exploratory factor analyses, whereby all of the 16 items were entered using the unweighted least squares method. We extracted factors with eigenvalues of greater than one and then obtained factor structures with Promax rotation. Next, we conducted confirmative factor analyses, whereby we compared the fit of a one-factor model, which assumed that all items measuring the four constructs load on one general recovery experiences factor, to that of a four-factor model, which assumed that each item loads on a hypothesized factor.

In evaluating construct validity, we investigated the relationship of recovery experiences with potential predictors (i.e., job demands and job control) and consequences (i.e., psychological distress, physical complaints, work engagement and job performance). In evaluating internal consistency, values for Cronbach’s alpha were calculated.

Results

Factorial validity

Table 2 shows the results of exploratory factor analyses. Contrary to our assumptions, three factors with eigenvalues of greater than one were extracted. Factor 1 consisted of 8 items regarding psychological detachment and relaxation; Factor 2 consisted of 4 items regarding control; and finally, Factor 3 consisted of 4 items regarding mastery. Interfactor correlation between Factor 1 and Factor 2 was 0.65; that between Factor 1 and Factor 3 was 0.39; and that between Factor 2 and Factor 3 was 0.48.

In the next step, we conducted confirmatory factor analyses. Since we had three factors extracted by exploratory factor analysis, the fit of the three models (i.e., one, three and four-factor models) was assessed. In the three-factor model, psychological detachment and relaxation items loaded on the first factor; mastery items loaded on the second factor; and control items loaded on the third factor. As can be seen in Table 3,

Table 2. Results of exploratory factor analysis with an unweighted least squares method and promax rotation (N=2,520)

No.	Items	Factor 1: Psychological Detachment & Relaxation	Factor 2: Control	Factor 3: Mastery
5	I don't think about work at all (PD)	0.888	-0.267	-0.071
10	I distance myself from my work (PD)	0.859	-0.071	-0.080
3	I forget about work (PD)	0.812	-0.152	-0.009
16	I get a break from the demands of work (PD)	0.705	0.084	0.011
11	I do relaxing things (RE)	0.616	0.249	0.047
12	I use the time to relax (RE)	0.608	0.254	0.040
6	I kick back and relax (RE)	0.598	0.211	0.021
14	I take time for leisure (RE)	0.572	0.199	0.066
9	I determine for myself how I will spend my time (CO)	-0.039	0.904	-0.074
4	I decide my own schedule (CO)	-0.071	0.837	-0.038
1	I feel like I can decide for myself what to do (CO)	-0.148	0.801	0.043
13	I take care of things the way that I want them done (CO)	0.259	0.555	0.028
7	I seek out intellectual challenges (MA)	0.020	-0.141	0.908
8	I do things that challenge me (MA)	0.003	-0.040	0.873
2	I learn new things (MA)	-0.215	0.123	0.761
15	I do something to broaden my horizons (MA)	0.166	0.035	0.682

PD = psychological detachment, RE = relaxation, MA = mastery, CO = control.

Table 3. Results of confirmatory factor analyses: Comparison of goodness-of-fit indices among one-factor, three-factor and four-factor models

Model	GFI	AGFI	PGFI	NNFI	CFI	PNFI	RMSEA	χ^2	df	p
One-factor model ^{a)}	0.64	0.52	0.49	0.59	0.65	0.56	0.19	9,317.55	104	0.000
Three-factor model ^{b)}	0.83	0.77	0.62	0.84	0.86	0.72	0.12	3,667.31	101	0.000
Four-factor model ^{c)}	0.88	0.83	0.63	0.88	0.90	0.74	0.10	2,598.84	98	0.000

N=2,520. GFI = Goodness of Fit Index, AGFI = Adjusted Goodness of Fit Index, NNFI = Non-normed Fit Index, CFI = Comparative Fit Index, PNFI = Parsimony Normed Fit Index, RMSEA = Root Mean Square Error of Approximation.

^{a)} All items measuring the four constructs load on one general recovery experiences factor. ^{b)} Psychological detachment and relaxation items loaded on the first factor; mastery items loaded on the second factor; and control items loaded on the third factor.

^{c)} Each item loads on a hypothesized factor.

the four-factor model fit the data better than the one-factor model ($\Delta\chi^2(6) = 6,718.71, p < 0.001$) and three-factor model ($\Delta\chi^2(3) = 1,068.47, p < 0.001$). In the four-factor model, all items significantly loaded on their respective latent factors ($p < 0.001$).

Internal consistency

The values for Cronbach's alpha were 0.85 for psychological detachment, 0.89 for relaxation, 0.87 for mastery and 0.85 for control.

Relationship with potential predictors and consequences of recovery experiences

Table 4 shows the correlations between all study variables, including recovery experiences, potential predictors and consequences of recovery experiences. Job demands were negatively related to all recovery experience variables with the exception of mastery. Job control was positively related to all recovery

experience variables with the exception of psychological detachment. Psychological distress and physical complaints were negatively related to all recovery experience variables. Work engagement was positively related to relaxation, mastery and control, whereas it was negatively related to psychological detachment. Job performance was positively related to all recovery experience variables. To explore curvilinear relationships between the recovery experiences and job performance, we conducted multiple regression analysis in which we entered the recovery experience as a simple (in order to control for the linear effect) and squared scores of the recovery experiences. Analyses showed that the standardized betas of squared psychological detachment ($\beta = -0.26; p < 0.05$), squared relaxation ($\beta = -0.29; p < 0.05$) and squared control ($\beta = -0.43; p < 0.01$) were significant. All linear effects remained positive and significant. The negative sign of the regression weight of the squared recovery experiences

Table 4. Means, standard deviations, internal consistencies (Cronbach’s alpha on the diagonal) and correlations of the variables used in the study (N=2,520)

Measures	Mean	SD	1	2	3	4	5	6	7	8
Demographics										
1 Age	44.43	12.87	(n.a.)							
2 Gender ^{a)}	1.50	0.50	-0.01	(n.a.)						
3 Marriage ^{b)}	1.38	0.49	-0.38***	0.11***	(n.a.)					
4 Education ^{c)}	1.45	0.50	-0.09***	-0.26***	0.03	(n.a.)				
5 Occupation ^{d)}	1.29	0.46	0.04	-0.02	0.02	-0.25***	(n.a.)			
6 Shift work ^{e)}	1.18	0.38	-0.10***	0.12***	0.05**	-0.10***	0.24***	(n.a.)		
7 Working hours (per week)	37.24	24.87	-0.06**	-0.23***	0.01	0.11***	-0.09***	-0.08***	(n.a.)	
Recovery experiences										
8 Psychological detachment	3.44	0.88	-0.01	0.12***	0.06**	-0.02	-0.02	0.03	-0.06**	(0.85)
9 Relaxation	3.69	0.85	-0.04*	0.10***	0.08***	0.01	-0.01	0.03	-0.05**	0.70***
10 Mastery	3.16	0.90	0.15***	-0.04*	-0.01	0.11***	-0.06**	-0.05**	0.00	0.26***
11 Control	3.93	0.78	0.08***	0.11***	0.14***	0.03	-0.06**	-0.02	-0.01	0.47***
Possible predictors (job situation variables)										
12 Job demands	2.54	0.76	-0.18***	-0.14***	0.05*	0.10***	-0.05*	0.04	0.21***	-0.17***
13 Job control	2.65	0.69	0.14***	-0.15***	-0.07***	0.08***	-0.17***	-0.21***	0.05*	0.01
Possible consequences (well-being)										
14 Psychological distress	2.00	0.68	-0.27***	-0.01	0.14***	0.01	-0.01	0.06**	0.08***	-0.18***
15 Physical complaints	1.74	0.52	-0.14***	0.10***	0.08***	-0.03	-0.01	0.04*	0.03	-0.14***
16 Work engagement	2.82	1.23	0.23***	-0.03	-0.12***	0.03	-0.05*	-0.07***	0.01	-0.08***
17 Job performance	6.24	1.85	0.23***	0.03	-0.14***	-0.02	0.00	-0.01	0.02	0.12***

Measures	9	10	11	12	13	14	15	16	17
Demographics									
1 Age									
2 Gender ^{a)}									
3 Marriage ^{b)}									
4 Education ^{c)}									
5 Occupation ^{d)}									
6 Shift work ^{e)}									
7 Working hours (per week)									
Recovery experiences									
8 Psychological detachment									
9 Relaxation	(0.89)								
10 Mastery	0.40***	(0.87)							
11 Control	0.65***	0.40***	(0.85)						
Possible predictors (job situation variables)									
12 Job demands	-0.12***	-0.02	-0.09***	(0.81)					
13 Job control	0.07**	0.15***	0.17***	-0.08***	(0.74)				
Possible consequences (well-being)									
14 Psychological distress	-0.23***	-0.21***	-0.20***	0.39***	-0.21***	(0.94)			
15 Physical complaints	-0.17***	-0.15***	-0.13***	0.23***	-0.14***	0.59***	(0.85)		
16 Work engagement	0.10***	0.36***	0.19***	0.08***	0.28***	-0.34***	-0.19***	(0.95)	
17 Job performance	0.18***	0.26***	0.21***	-0.03	0.18***	-0.35***	-0.19***	0.45***	(n.a.)

*** $p < 0.001$, ** $p < 0.01$. Alpha coefficients are displayed in parentheses.

^{a)} Gender was coded as 1 (men) and 2 (women). ^{b)} Marriage was coded as 1 (yes) and 2 (no). ^{c)} Education was coded as 1 (college or lower) and 2 (university or higher). ^{d)} Occupation was coded as 1 (white collar) and 2 (blue collar). ^{e)} Shift work was coded as 1 (no) and 2 (yes).

implies that at high levels of psychological detachment, relaxation and control, the positive relationships between the recovery experiences and job performance became less prominent. Inspection of the plots showed that at intermediate levels of psychological detachment, relaxation and control, job performance did not increase further and remained at a high level; it did not decrease when psychological detachment, relaxation and control job performance further increased. The standardized beta of squared mastery was not significant ($\beta=0.00$; $p>0.05$).

Discussion

The aim of this study was to validate the Japanese version of the REQ in a sample of Japanese employees from heterogeneous occupations. In doing so, we conducted exploratory and confirmatory factor analyses to evaluate factorial validity and investigated the relationship with potential predictors and consequences of recovery experiences to evaluate construct validity. In addition, we examined internal consistency to evaluate its reliability.

From exploratory factor analyses, three factors with eigenvalues of greater than one were extracted, whereby psychological detachment and relaxation were condensed into one factor. This result was in contrast with the original REQ study⁴, which extracted four factors.

However, a series of confirmatory factor analyses revealed that the hypothesized four-factor model fit the data better than the one-factor and three-factor models, suggesting that it would be better to treat recovery experiences as four distinct constructs. The internal consistency of each of the four subscales was sufficient ($0.85 < \alpha < 0.89$), meeting the stringent criterion of 0.80³⁷. In addition, previous research^{4, 17} suggested that psychological detachment and relaxation have different causes and consequences, meaning that differentiation between the two aspects (i.e., psychological detachment and relaxation) would be preferred over a single construct. Hence, we decided to treat recovery experience as four different constructs in line with the original study⁴, which, we believe, would facilitate the comparability of research findings.

As far as the relationship with potential predictors of recovery experiences is concerned, job demands were negatively related to psychological detachment, relaxation and control. These results were in line with earlier research^{4, 8} and suggest that 1) individuals with high job demands have difficulties in mentally switching off from work during leisure time; 2) prolonged activation due to high job demands hinders relaxation during off-job time; and 3) high job demands leave less time available for leisure activities, which reduces

the amount of time the individual can have control over during off-job time. Contrary to our expectations, job demands had no relationship with mastery, suggesting that job demands might not always have adverse effects on mastery experiences. Truly, job demands and associated fatigue may make it difficult to initiate and uphold the activities that result in mastery experiences⁴. However, job demands, on the positive side, may provide individuals with challenging experiences and learning opportunities in other domains to build up new internal resources. These complex characteristics of job demands may have led to a practically zero relationship with mastery.

Job control had positive relationships with relaxation, mastery and control, whereas it had no relationship with psychological detachment. This suggests that job control has a complex relationship with recovery experiences. More specifically, job control makes it possible to work more flexibly³⁸, leading to more recovery opportunities such as leisure activities for relaxation, mastery, and control over one's own life²¹. However, at the same time, job control often implies the responsibilities for fulfilling one's duty and the necessity to make decisions, which makes it more difficult to detach from work even during off-job time⁴.

As far as relationships with potential consequences of recovery experiences are concerned, recovery experiences were generally positively correlated with psychological and physical health, work engagement and job performance, suggesting that recovery experiences would lead to better well-being. When testing curvilinear relationships between recovery experience and job performance, we found that the relation between psychological detachment, relaxation and control on the one hand and job performance on the other flattened after intermediate levels of the recovery experiences. This pattern of findings suggests that performance increases when psychological detachment, relaxation and control increases from a low to an intermediate level. However, employee performance does not benefit any further from extremely high levels of psychological detachment, relaxation or control. It is important to note that performance does not suffer at such very high levels of the recovery experiences. Future study needs to examine curvilinear relationships in more detail.

However, it should be noted that psychological detachment was negatively correlated with work engagement ($r=-0.08$) in contrast with previous studies^{4, 17, 27, 39}. This suggests that, at least for our respondents, switching off mentally during off-job time did not improve work engagement but rather decreased it. When individuals are mentally detached from their jobs during off-job time, they may feel difficulty in

“switching on” again in the next morning²⁵⁾, and they may need more time to mobilize their energy for their job, which results in impaired work engagement. As Binnewies *et al.*⁴⁰⁾ pointed out, thinking about work may not be necessarily negative per se. Positively reflecting about one’s work (e.g., thinking about a recent success or about an inspiring goal) might even improve work engagement. Future research needs to clarify the optimal level of psychological detachment and the preferable type of work-related thoughts during off-job time to improve work engagement.

Limitations and future directions

The present study has several limitations. First, it is based on survey data that used self-reported measures. Next to self-report bias due to, for example, negative affect, common method variance might have affected the results, suggesting that the true associations between variables might be weaker than those observed in this study. A study by Fritz *et al.*²⁵⁾, however, that avoided common method variance arrived at similar findings with respect to well-being outcomes. Nevertheless, our findings should be replicated with objective measures in the future.

A second possible limitation is that we used a cross-sectional design, which precludes causal inferences. For instance, our data showed that recovery experiences were related to most of the indicators of well-being. This might indicate that good recovery experiences lead to better well-being. It might also be that individuals enjoying better well-being are more likely to have more positive recovery experiences. Based on the cross-sectional analyses of the current study, it can only be concluded that recovery experience is related to well-being. A recent longitudinal study demonstrated that lack of psychological detachment predicts poor well-being over the course of one year³⁷⁾. More longitudinal research is needed that uncovers the causal order in the relationship between recovery experiences and their predictors and consequences.

Finally, our data were collected via the Internet, which requires caution regarding the generalizability of our findings, as the representativeness of the sample may be challenged. It is claimed that the socioeconomic and educational status of the average Internet user is usually above that of the general population⁴¹⁾. Indeed, our participants had higher educational statuses compared with those from nationwide surveys in Japan, which were administered by a paper-and-pencil method⁴²⁾. Thus, similar to typical Internet studies, self-selection might be a limitation of the present study. However, on the positive side, the present research included employees from a wide range of different occupations, whereas many studies

on occupational health are biased towards a specific group or occupation. Future research should examine whether or not our findings can be generalized to those obtained by paper-and-pencil assessment.

Conclusion

In conclusion, this study confirmed that REQ-J is an adequate measure of recovery experiences that can be used in the Japanese context.

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Appendix

日本語版リカバリー経験尺度

以下の質問文は、「1日の仕事が終わった後の時間の過ごし方」について尋ねたものです。ご自身の状況に当てはまる程度をお答え下さい。それぞれの質問が類似しているように見えても、すべての項目に回答して下さい。

		全く当てはまらない	あまり当てはまらない	どちらともいえない	やや当てはまる	よく当てはまる
01	何をするか自分で決められると思う	1	2	3	4	5
02	新しいことを学ぶ	1	2	3	4	5
03	仕事のことを忘れる	1	2	3	4	5
04	自分のスケジュールは自分で決める	1	2	3	4	5
05	仕事のことは全く考えない	1	2	3	4	5
06	くつろいでリラックスする	1	2	3	4	5
07	知的に挑戦できることを探し出す	1	2	3	4	5
08	やりがいのあることに挑戦する	1	2	3	4	5
09	時間の過ごし方は自分で決める	1	2	3	4	5
10	仕事と距離を置く	1	2	3	4	5
11	リラックスできることをする	1	2	3	4	5
12	リラックスするために時間を使う	1	2	3	4	5
13	自分のやりたいように物事を片付ける	1	2	3	4	5
14	余暇に時間をかける	1	2	3	4	5
15	自分の視野が広がることをする	1	2	3	4	5
16	仕事での負担から離れて、ひと休みする	1	2	3	4	5

【下位尺度と該当項目】

心理的距離：03, 05, 10, 16

リラックス：06, 11, 12, 14

熟達：02, 07, 08, 15

コントロール：01, 04, 09, 13