A New Perspective on the Effects of Different Types of Job Demands on the Well-being of a Sample of Chinese Workers

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Abstract

This study extended the Wellbeing Process Questionnaire by adding new variables, namely a multi-dimensional demands measure and work-related rumination. One hundred and nine employees from a variety of jobs in mainland China participated in the survey. The Wellbeing Process Questionnaire contained 38 questions measuring 11 dimensions. The results showed that the scales had good reliability. Analyses controlling for the combined effects of established predictors of well-being showed that work uncertainty negatively impacted well-being. Affective rumination was negatively associated with well-being, whereas problem-solving pondering was positively associated with well-being. The combined effects of established predictors of well-being must be controlled when assessing the impact of other variables. When this was done, unpredictable job demands and rumination were shown to be associated with well-being.

Keywords: Demands Resources-Individual Effects model; Wellbeing Process Questionnaire; job demands; affective rumination; problem-solving pondering

1.1 Introduction

The present study aimed to extend research on job demands and investigate the effects of rumination on well-being. These two topics were placed in the context of the Demands-Resources-Individual Effects model and recent developments in measuring the well-being process. These are introduced in the following sections.

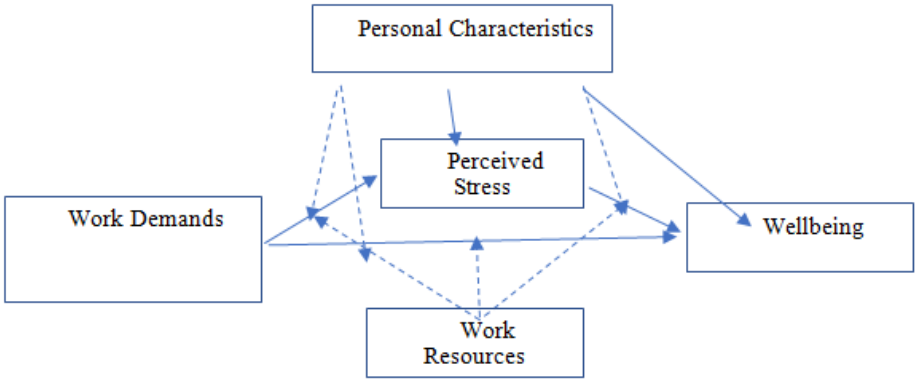
1.2 Well-being

Psychologists now actively advocate positive psychology with well-being as the core, which has shifted psychological research from psychological illness and stress to positive aspects such as happiness and job satisfaction. With the increase of research, the concept of well-being has become more holistic and diverse. For example, researchers have proposed the dualistic view: hedonic happiness and eudaimonic happiness (Ryan & Deci, 2001); the tertiary concept: life satisfaction, hedonic happiness and self-realised happiness (Steptoe, Deaton & Stone, 2015); subjective well-being, workplace well-being and psychological well-being (Page & Vella-Brodrick, 2009). Behind these classifications, there is a standard view that well-being is multi-dimensional. In real life, the components of people's happiness must be diverse and abundant. It involves not only a positive emotional state but also a good subjective perception. Therefore, a comprehensive and integrated measurement theory is needed to get closer to the reality of well-being and understand the whole picture.

1.3 The Demands Resources Individual Effects (DRIVE) model

The Demands Resources-Individual Effects (DRIVE) model (showed in Figure 1) was developed to account for predictors of occupational stress and has become a flexible and systematic explanation of well-being (Mark & Smith, 2008). It comprehensively covers all aspects of well-being and systematically considers work and individual characteristics' influence on well-being. The model proposes internal mechanisms that can account for how the objective factors of work demand and job resources affect well-being (e.g. through individual subjective assessment). The flexibility of the DRIVE model is not only reflected in the broad measure of the well-being construct, more specifically, based on its basic framework, but researchers can also expand the constituent elements in the framework according to the research context, thereby continuously deepening the understanding of what kind of mechanism is required for work characteristics to influence specific aspects of well-being.

Figure 1: The Demands, Resources, and IndiVidual Effects (DRIVE) Model



1.3 The Wellbeing Process Model

However, a possible problem with this model of the well-being process is that it contains so many dimensions that many items have to be included in surveys, limiting its practical application. The Wellbeing Process Questionnaire (WPQ) was developed (Williams, 2015) to solve this problem. This process involved using smaller numbers of questions rather than longer scales. Studies have shown that the reliability and validity of the WPQ scales are good, and the short items have a high correlation with the scales using multiple items. The reliability and validity of the multi-item and single-item versions of the DRIVE model's well-being process scale have been well verified with European employees (Williams & Smith, 2016, 2018a; Williams, Pendlebury & Smith, 2017). Empirical studies also confirm that under the premise of the DRIVE model, the reliability and validity of the WPQ scale showed good stability in workers even after the addition of new variables such as work-life balance and burnout (Omosehin & Smith, 2018). More importantly, the causal relationship between variables is supported by longitudinal measurement data (Galvin, 2016; Williams & Smith, 2018b).

Nevertheless, the reliability and validity of WPQ should be tested in a broader cultural context. For example, is it suitable for Chinese employees whose cultural background and working life are significantly different from those in Europe? This was one of the issues examined in this study.

1.4 Well-being at work in China

Since the 21st century, China's economy has entered a stage of rapid growth. Under the premise of great satisfaction of material needs, people's psychological needs have gradually received more and more attention, and researchers in China and abroad have carried out surveys of Chinese residents' well-being. One study (Easterlin et al., 2010) analysed the data from the 1990-2007 World Values Survey and concluded that China's economic growth is accompanied by a decline in per capita life satisfaction. Other research (Liu, Xiong&Su, 2013) found that the average happiness of each person increased from 3.27 in 2003 to 3.77 in 2010 by analysing the data of the China General Social Survey (CGSS). Other researchers (Bian et al., 2015) have found that 44.2% of the 10,927 respondents in the survey of Chinese social changes considered themselves happy. These different conclusions could reflect the changes in Chinese people's well-being to a certain extent but could also be due to the different measurement tools used in these studies, making it impossible to compare the different results and understand some conflicting results. Both social reality and research status indicate that there is still much room for exploring Chinese residents' well-being in the context of rapid economic development. The phenomenon of China's economic growth inspiring the pursuit of well-being is more typically reflected in the workplace employees. The satisfaction of material life makes them pay more and more attention to the non-material level of support that work can provide for life, namely the well-being experienced in the work process. The well-being of employees at work affects their personal physical and mental health, family life, and interpersonal relationships and affects the performance and development of the organisation. Therefore, in today's social context, the possible conflict between the prevailing workplace pressure brought about by economic development and employees' pursuit of happiness has become one of the ten future major trends of Chinese organisational research (Xu et al., 2015)

1.5 Job Demands

In the original version of the WPQ, job demands were assessed using a single question: "I feel that I do not have the time I need to get my work done (for example, I am under constant time pressure, interrupted in my work, or overwhelmed by responsibility or work demands)." Job demands have recently been conceptualised as multi-dimensional (e.g., challenge and hindrance demand, Cavanaugh et al., 2000). Therefore, according to previous research's conceptualisation of job demands (Widmer et al., 2012), this study chose work uncertainty to represent hindrance pressures, work quantitative demands, and speed demands to represent challenge pressures.

1.6 Rumination

Today, with the ever-increasing economic growth, work demands continue to increase, and the unfinished goals to be handled by employees when they are off work are soaring. According to the goal process theory, unfinished goals directly cause personal rumination (Martin, Shrira& Startup, 2008). Rumination caused by work content is called work-related rumination, which refers to the state of some people repeatedly thinking about work-related issues and events outside of work (Cropley et al., 2012). Since this phenomenon was officially proposed in 2011, it has attracted more and more attention from occupational health psychology researchers. Results from both small-scale studies (Michalianou, 2011), and large-scale surveys of thousands of people (Gallie et al., 1998), have shown that at least 70% of employees have been disturbed by work after they leave work, and they continue to think about their work in leisure time (Weinberger et al., 2018).

Working-related rumination can be divided into affective rumination and problem-solving pondering (Cropley et al., 2012). Affective rumination is a negative cognitive state, and the ruminant content focuses on the negative emotional experience brought about by work issues. It is invasive, widespread, and repetitive. Individuals experience negative emotions such as tension and boredom when ruminating. The problem-solving pondering reflects the individual's continuous psychological review of a particular problem or how work can be improved by evaluating previous work, including thinking about the problem from a new perspective, finding and removing obstacles, and developing creative ideas. The process of problem-solving enables individuals to generate positive emotions and obtain pleasant experiences. Research (Frone, 2015) has shown that these two dimensions affect an individual's work and life. Work-related rumination belongs to continuous cognition, which is essentially a cognitive evaluation. Affective rumination involves individuals thinking that solving work problems is an inevitable pressure beyond their control (Praettoni et al., 2007).

In contrast, problem-solving pondering involves actively solving work problems and thinking that work-related content is within their control (Cropley & Zijlstra, 2011). Therefore, based on the existing research, different types of rumination may be the key to employees having a sense of pressure, suggesting that one should add work-related rumination between the work demands and the perceived stress of the DRIVE model. Recent research (Zhang, Ma & Smith, 2020) has confirmed the effects of rumination in a sample of Chinese workers.

1.7 Combined effects of established predictors of well-being

The present study also included two methodological features designed to simplify research on the well-being process. In order to evaluate new components of well-being, it is essential to have a short version of the established predictors and outcomes. This has been done with other measures of occupational well-being (e.g. the Smith Wellbeing Questionnaire (SWELL) and Short SWELL (Smith & Smith, 2017a, b). This approach was continued here with the WPQ. Research has shown that the established predictors are mainly independent and additive. This means that a combined effects score can reduce the number of variables in the analyses. In addition, using a single combined predictor score (covering predictors of both positive and negative outcomes) and a single well-being dependent variable (based on the difference between positive and negative outcomes) reduces the number of analyses and possible chance effects.

To sum up, this study examined the applicability of the WPQ to Chinese workers and expanded the model to include different types of job demands and rumination, which may better explain the well-being process. Effects of these factors were examined with the combined established predictors as covariates.

2 Materials and Methods

The current study was approved by the University's Institutional Review Board of the first author and carried out with the informed consent of the participants.

2.1 Sample size calculation

Previous research has shown that a sample size of about 100 can replicate the established effects of the well-being process (Omosehin & Smith, 2018; Galvin, 2016).

2.2 Participants and Procedure

Participants were employees from enterprises and public institutions in China. The aim was to have a heterogeneous sample rather than focusing on a specific profession. This sample type allows one to examine whether the well-being process applies to a diverse range of workers. The participants were identified through convenience sampling, and the online questionnaires were distributed to the participants by WeChat and QQ chat software. Participation in this study was voluntary and anonymous, and participants received an online gift certificate at the end of the data collection. Data were collected from 128 participants. Of these, the response time of 19 people was too short (less than 180 seconds) to read the questions seriously, so their data were deleted.

The sample had a mean age of 36.8 years (range 17-64 years). The other demographic data of the sample are presented in Table1.

Table 1: Demographic and work characteristics of the sample

Variable	Category	Frequency	Percentage
Gender	male	48	44.0%
	female	61	56.0%
Work type	State-owned company	11	10.1%
	Non-state-owned company	21	19.3%
	Public institution	47	43.1%
	Government agency	7	6.4%
	Other	23	21.1%
Education	High school or less	14	12.8%
	Junior degree	23	21.1%
	Bachelor's degree	56	51.4%
	Master's degree or above	16	14.7%
Tenure	< 5 years	38	34.9%
	5-10 years	33	30.3%
	11-20 years	27	24.8%
	>20 years	11	10.1%
Manager	Yes	45	41.3%
	No	64	58.7%

2.3 Measures

For each question, the translation and back-translation method was used to translate the scales from English into Chinese. Two employees and a psychology doctoral student were asked to evaluate the accuracy of semantic expression after translation. Discrepancies were resolved through discussion between the two translators and the study investigators.

The Chinese version of the scale and the English version can be accessed online (Zhang & Smith, 2021). The WPQ measures direct relationships between work demands, work resources, individual differences, and outcomes. Work demands and work resources represented work characteristics. Specifically, work demands included four items of work uncertainty (Burr et al., 2019) on a five-point Likert scale from 1 (= strongly disagree) to 5 (= strongly agree); 2 items of quantitative demand and two items of work pace demand on a five-point Likert scale from 1 (= always) to 5 (= never/hardly ever). Five items of work resources, three items of positive personality, six items of positive well-being, four items of negative well-being, 1 item of job satisfaction and 1 item measuring perceived stress, were all from WPQ and responses were made on a Likert scale from 1 (=, not at all) to 7 (= very much so). Affective rumination and problem-solving pondering were measured with a ten-item questionnaire (Cropley et al., 2012) with responses on a five-point Likert scale from 1 (= very seldom or never) to 5 (= very often or always). Variables were not all measured using the same rating scale to avoid response bias (Podsakoff et al., 2003).

3 Results

3.1 Validity analysis

The variables were all derived from established questionnaires, and their validity has been verified in many studies. The Cronbach alpha values shown in Table 2 confirm this.

Table 2: Reliability coefficients for the new well-being process questionnaire

Work Resource	0.70
Positive Personality	0.80
Work Uncertainty	0.84
Quantitative Demand	0.68
Work Pace	0.71
Positive Well-being	0.89
Negative Well-being	0.90
Affective Rumination	0.90
Problem-solving Pondering	0.86

3.2 Associations between the combined predictor score and the total well-being score

A combined positive predictor score was calculated in the following way, which was based on previous methodology (Cohen, Tyrrell & Smith, 1991; Smith, McNamara &Wellens, 2004). First, because the different scales had different numbers of items, they were subdivided into quartiles. Predictors of positive well-being were then summed, and the predictors of negative well-being were subtracted from the sum of the positive predictors. A total well-being outcome score was derived in a similar way (sum of the quartiles of the positive outcome and appraisal scores – the sum of the quartiles of the negative outcomes and appraisal scores). As expected, there was a significant correlation between the combined predictor score and the overall well-being score ($r = 0.64$, $p < 0.001$).

A stepped regression analysis was then carried out on the total well-being score with demographic variables in the first model and the combined predictor score in the second model (see Table 3). Again, the predictor score was strongly associated with the overall well-being score, and there were no significant effects of the demographic variables on well-being.

Table 3: Regressions predicting total well-being

Variable	Unstandardised beta	Standard error	Standardised beta	t value	p-value
Model 1: (Constant)	-4.785	10.077		-.475	.636
gender	3.109	2.040	.157	1.524	.131
age	.093	.145	.070	.639	.524
education	1.052	1.206	.094	.873	.385
manager or not	-.393	1.912	-.020	-.206	.837
tenure	-.861	1.036	-.091	-.831	.408
job type	.281	.804	.035	.349	.728
daily work time (h)	-.253	.469	-.052	-.540	.591
lifestyle	2.364	.687	.344	3.440	.001
Model 2: (Constant)	-14.289	9.289		-1.538	.127
gender	1.580	1.865	.080	.847	.399
age	.120	.131	.091	.916	.362
education	1.663	1.094	.148	1.520	.132
manager or not	.065	1.726	.003	.037	.970
tenure	-.653	.935	-.069	-.699	.486
job type	.326	.725	.040	.449	.654
daily work time (h)	-.309	.423	-.063	-.731	.466
lifestyle	.787	.698	.114	1.128	.262
Combined predictors	1.630	.332	.477	4.904	.000
Model 3: (Constant)	-.447	9.390		-.048	.962
gender	.523	1.595	.026	.328	.744
age	.056	.111	.042	.500	.618
education	2.207	.940	.197	2.348	.021
manager or not	-.232	1.497	-.012	-.155	.877
tenure	-.482	.794	-.051	-.607	.546
job type	.436	.629	.054	.693	.490
daily work time (h)	-.388	.373	-.079	-1.040	.301
lifestyle	1.118	.596	.163	1.877	.064
Combined predictors	.682	.330	.199	2.067	.041
Uncertainty at work	-.429	.211	-.174	-2.033	.045

Get behind with work	.165	.487	.027	.338	.736
Fast pace	.420	.418	.078	1.004	.318
Affective rumination	-.908	.217	-.381	-4.191	.000
Positive pondering	.723	.238	.259	3.038	.003

3.3 Associations between job demands, affective rumination, problem-solving pondering and the total well-being score covarying the combined predictor score

Job demands, affective rumination and positive problem solving were added as the next step in the regression analyses. This final model is shown in Table 3, Model 3. As in the previous regression, the total combined predictor score was significant. Affective rumination had a highly significant negative association with well-being, whereas problem pondering was associated with better well-being. Regarding job demands, only uncertainty was significant, with greater uncertainty being associated with lower well-being.

4 Discussion

This study confirmed that the well-being process could be examined simply by combining positive predictors and subtracting the sum of those variables associated with reduced well-being. Similarly, the outcomes can be reduced to a single score (Wadsworth et al., 2010), namely the sum of positive appraisals and outcomes minus negative appraisals and outcomes. The reliability and validity of the scales were good. The association between the combined predictor score and the well-being outcomes was still significant when demographic variables were included in the model. The only component of job demands to have a significant effect was uncertainty. Most studies of job demands use questions relating to the pace of work. This component was not significant when the other established predictors and other components of job demands were included in the model. This is an important finding and suggests that job uncertainty is added to the DRIVE model.

Affective rumination was a significant predictor of the well-being outcome. We hypothesised a cognitive, evaluative factor - work-related rumination - between work demands and perceived stress. This hypothetical model was not tested in this study because of the sample size. This hypothesis model testing should also be carried out in future large-sample studies.

Work-related rumination can now be added to the mechanism by which work demands affect well-being, enhancing the Demands Resources-Individual Effects model and promoting its development. This again demonstrates the flexibility and inclusiveness of the DRIVE model. In addition, previous studies and the current research have shown that two types of work-related rumination have opposite effects on outcome variables. For example, affective rumination negatively predicts work engagement (Kinnunen et al., 2017) and work creativity two years later (Vahle-Hinz et al., 2017); while, problem-solving pondering can significantly predict job creativity (Vahle-Hinz et al., 2017) and the level of work engagement (Vahle-Hinz et al., 2017). However, there is still a lack of research on the mechanism of these different effects.

Finally, this study examined the applicability of the WPQ scale to Chinese employees. The results verify the validity of the WPQ scale in a broader cultural context and provide an effective tool for Chinese occupational and organisational management psychology to analyse the impact of work characteristics on employee well-being. Therefore, it lays a foundation for the systematic understanding and comparison of the well-being status of Chinese employees of different occupational types.

5. Limitations and Future Research

Future research needs to test the reliability and validity of the Chinese version of the scale with a larger sample size. Another limitation is that this study only obtained evidence for the minimum reliability of the scales. In the future, multiple measurements can be carried out to obtain test-retest reliability. Thirdly, the data of this study are cross-sectional, so it is impossible to make causal inferences on the relationship between variables. When testing hypothetical models in the future, a longitudinal study design should be considered, preferably with an intervention, to analyse better the sequential relationship between variables in the well-being process.

6. Conclusions

Job demands involve many different dimensions, and the present study investigated the effects of a multi-dimensional measure of work demands and rumination. The outcomes were positive and negative well-being, and the sample were Chinese workers.

The scales had good reliability, and the analyses adjusted for the combined effects of established predictors. Work uncertainty and affective rumination negatively affected well-being, whereas positive pondering was positively associated with well-being. These effects remained significant when the combined effects of established predictors were statistically controlled.

Further research can develop this approach to investigate other contexts, other samples and possible factors added to the workload-wellbeing model. Longitudinal studies, preferably with interventions, will also allow a better understanding of underlying mechanisms linking the model's components.

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Conflict of interest

The authors of this article declare no conflict of interest.

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