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How are changes in exposure to job demands and job resources related to burnout and engagement? A longitudinal study among Chinese nurses and police officers

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Abstract

This study used a person-centered approach to examine the across-time relationships between job demands and job resources on the one hand and employee well-being (burnout and work engagement) on the other. On the basis of the job demands–resources model and conservation of resources (COR) theory, increases in demands and decreases in resources across time were expected to result in unfavorable changes in well-being across time. The results of a 2-wave study among 172 nurses and 273 police officers showed several common patterns across both samples: (a) participants who experienced an increase of demands showed a significant increase in burnout, whereas participants who reported having low resources at both measurement times also showed a significant increase in burnout; (b) participants who experienced decreasing resources reported a significant increase in burnout and a significant decrease in engagement; (c) participants who were exposed to chronic low job resources in a highly demanding environment showed a significant increase in burnout; and (d) participants who were exposed to decreased job resources in a highly demanding environment showed a significant increase in burnout.

KEYWORDS

burnout, JD-R model, longitudinal research, person-centered approach, work engagement

1 | INTRODUCTION

As a comprehensive yet parsimonious stress model, the job demands–resources (JD-R) model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001a) has been applied in numerous occupational groups. The model is based on three assumptions. First, it is assumed that the presence of job resources (defined as positively valued physical, social, or organizational aspects of the job that foster personal growth and development and that have motivational qualities) increases work engagement and decreases burnout through a *motivational process* (Schaufeli & Bakker, 2004). Second, high job demands (i.e., the physical, social, or organizational aspects of the job that require sustained physical or psychological effort and that are associated with certain psychological and/or physiological costs) exhaust employees' mental and physical resources, leading to a depletion of energy and possibly burnout through a *health impairment process*. Finally, it is assumed that (a) job resources buffer the potentially negative effects of excessive job demands on employee health and well-being and (b) highly demanding work situations in combination with high levels of job resources result in higher levels of work engagement (Bakker & Demerouti, 2007).

The JD-R model considers job resources as facilitators of functioning: Their presence can help employees in attaining their work goals. This aligns with Hobfoll's (1998) conservation of resources (COR) theory that assumes that individuals strive to obtain, retain, foster, and protect those resources they value, because resources facilitate goal achievement. However, in the COR theory, resources are defined more broadly than in the JD-R model (Halbesleben, Neveu, Paustian-Underdahl, & Westman, 2014). The COR theory refers not only to specific situation-related resources (such as job resources) but also to universal psychological resources such as resilience (Shin, Taylor, & Seo, 2012) and psychological availability (Russo, Shteigman, & Carmeli, 2016).

The COR theory predicts that people will initiate and persist in particular behaviors if they believe that these behaviors will lead to desired outcomes or goals (Hobfoll, 1998). In turn, goal selection and the pursuit of resources are related to the degree to which people

believe that these goals and resources will contribute to the satisfaction of psychological needs (Deci & Ryan, 2000). In this sense, psychological needs mobilize and direct the *psychological energy* that is essential for psychological growth, integrity, and well-being (Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008). That is, psychological energy is a necessary *nutriment* for individuals to actualize their potentials, to flourish, and to protect them from ill-health and maladaptive functioning (Deci & Ryan, 2000; Van Den Broeck et al., 2008). Thus, psychological needs represent an overarching psychological energy resource that individuals need in order to thrive, while thwarting of those needs has an energy-depleting effect. The work environment, whether resourceful or demanding, acts on employees' psychological energy because it influences their psychological needs and further triggers their motivation and behavior (Van Den Broeck et al., 2008). In this way, psychological energy resources may help them in bridging the gap between well-being and the characteristics of the workplace.

1.1 | Gains and losses

The COR theory argues that individuals with more resources are better positioned for resource gains, whereas individuals with fewer resources are more likely to experience resource losses (Whitman, Halbesleben, & Holmes, 2014). Integrating these ideas with the JD-R model allows us to examine the motivational and health impairment processes in this model in more detail. We discuss the two processes (i.e., health impairment and motivation processes) that relate demands to ill-health and resources to motivation, respectively, in the light of the insights offered by the COR theory. The JD-R model assumes that job resources, such as learning opportunities, job control, and social support, play a critical role in predicting employee well-being and motivation by satisfying their psychological needs for competence, autonomy, and relatedness, respectively (Van Den Broeck et al., 2008). In turn, this will lead to higher levels of well-being and motivation (e.g., engagement, cf. Schaufeli et al., 2004). Moreover, high levels of well-being foster the acquisition of additional job resources, leading to a so-called gain spiral (cf. Salanova, Schaufeli, Xanthopoulou, & Bakker, 2010); for instance, employees who feel happy generate more social support at work from coworkers and supervisors, possibly leading to better and more interesting jobs, which will result in even higher levels of well-being and motivation, and so on (De Lange, Taris, Kompier, Houtman, & Bongers, 2004). Conversely, thwarting of one's psychological needs has an energy-depleting effect (Moller, Deci, & Ryan, 2006). That is, individuals who lose or fail to gain (sufficient) job resources will experience psychological distress, negative affect, and lack of motivation, so that their energy resources are depleted (Gorgievski & Hobfoll, 2008). When energy resources are continuously depleted, normal functioning at work will be hampered and finally mental exhaustion will set in (Niks, Gevers, De Jonge, & Houtman, 2016). Thus, restoration of depleted resources seems vital in improving workers' health and well-being (Meijman & Mulder, 1998).

The JD-R model further assumes that when the work environment is demanding or lacks necessary job resources, employees must attain their goals and satisfy their needs through psychological accommodation (Deci & Ryan, 2000). The effort expenditure of psychological accommodation is inherently related to the so-called load reactions (e.g., higher blood pressure and fatigue) and may lead to psychological energy depletion (Meijman & Mulder, 1998). Load reactions can accumulate and may lead to impaired health and well-being, unless individuals fully recover from work strain (Niks et al., 2016). If recovery from work strain is inadequate or insufficient, the health impairment process will wear out employee's psychological energy resources (De Jonge, Spoor, Sonnentag, Dormann, & Van den Tooren, 2011). Burnout is the end state of a long-term process of resource loss that gradually develops over time as a result of depleted energy resources (Hobfoll & Freedy, 1993). For example, Demerouti, Bakker, De Jonge, Janssen, and Schaufeli (2001b) revealed that burnout is a function of high demands, whereas Bakker, Demerouti, Taris, Schaufeli, and Schreurs (2003) showed that job demands are primarily related to the exhaustion component of burnout. Similar to the gain spiral discussed above (Salanova et al., 2010), it may be assumed that the draining of psychological energy resources will cause employees to enter a loss spiral, leading to adverse outcomes such as disengagement and burnout (Hakanen, Bakker, & Schaufeli, 2006). Conversely, prevention of energy depletion is key to maintaining healthy functioning when adapting to stress (Hobfoll, 1998). In addition, fulfilled psychological needs generate a sense of energy, whereas unfulfilled needs reduce energy (Lens & Vansteenkiste, 2006; Van den Broeck et al., 2008). When individuals in a low-demand work environment lack autonomy, do not feel competent, and do not feel connected with others, they are likely to experience dissatisfaction, low energy, and feelings of exhaustion (Lens & Vansteenkiste, 2006). Thus, restoration of depleted energy resources is vital in improving workers' health and well-being (Meijman & Mulder, 1998).

Note that in demanding settings, the loss of resources may be difficult to prevent, and if it occurs, it will be more powerful than the gain of resources (Hobfoll, 2001). When psychological energy resources are threatened, individuals may therefore be inclined to focus on their losses and weaknesses (Gorgievski & Hobfoll, 2008) rather than on possible gains. On the one hand, this would imply that the combined risk for well-being of high job demands and low job resources is higher than the separate risks of high job demands and low job resources (Van Vegchel, De Jonge, & Landsbergis, 2005). On the other hand, a job that combines high job demands and high job resources provides a sense of challenge and offers a worker opportunities for learning, thus further enhancing a worker's psychological energy resources (Taris, Kompier, Geurts, Houtman, & Van den Heuvel, 2010).

1.2 | Longitudinal research on the dynamics of the JD-R model: variable- and person-centered methods

Most dynamic studies on the JD-R model explore the motivational process and health impairment process using longitudinal designs. For example, Castanheira and Chambel (2010) showed that salespeople's job demands were positively associated with exhaustion, which negatively impacted extra role performance, both concurrently and longitudinally. Similarly, a three-wave longitudinal study by Lizano and Barak (2012) found that high levels of job stress and work–family conflict were associated with later increases in exhaustion and depersonalization. Hakanen, Schaufeli, and Ahola (2008) found that high job resources were associated with high future work engagement, which

was in turn related to higher organizational commitment. Further, high job demands were associated with higher levels of burnout over time, which was in turn associated with future depression. Finally, Boyd et al. (2011) found that low job resources were associated with higher psychological strain and lower organizational commitment 2 years later. Thus, these studies largely support the idea that high demands lead to strain and ill-health over time, whereas high resources are associated with motivation and well-being.

In spite of these promising longitudinal results, research that focuses on the dual-process dynamics of the JD-R model (i.e., the motivational and the health impairment processes) is hampered by the fact that it tended to rely on variable-centered methods of data analysis, assuming that all individuals are homogeneous in how the predictors operate with respect to the outcome variables (Bergman & Magnusson, 1991). In the context of research in occupational health psychology, the relationships among job-related characteristics and well-being are often treated as single entities using structural equation modeling (e.g., Boyd et al., 2011; Hakanen et al., 2008). The strengths of such variable-centered approaches are well known and include the power of inferential statistics and model testing to yield causal inferences (Bergman & Andersson, 2010; Knisely & Draucke, 2016). However, this approach does not allow us to study the complex developmental trajectories relating to the associations between job-related characteristics and well-being and could leave important insights undetected. For example, the JD-R model assumes that the need to meet high demands may result in high levels of strain and ill-health, such as burnout. This implies that change in these demands will translate into corresponding changes in the outcomes: higher (lower) demands should be associated with higher (lower) levels of strain and ill-health. However, the absence of change could also affect the study outcomes. For example, stable exposure to high demands may also lead to ill-health, in that this would involve a continuous depletion of one's energy resources, hence increasingly higher levels of mental strain. Conversely, a situation with stable low demands means that the work environment contains few stimuli, which may frustrate the need for challenge and reduce a worker's opportunities for learning and development. In turn, this could affect a worker's level of psychological energy negatively.

Further, whereas changes in resources will translate into corresponding changes in work engagement, steady exposure to high job resources should also be associated with high and perhaps even increasing levels of work engagement, in that the motivational potential of resources will initiate, maintain, and even boost people's psychological energy (cf. Hobfoll, 1989; Van Den Broeck et al., 2008). Conversely, in chronic low-resource settings, individuals are less likely to derive benefit from support cycles, because they possess fewer resources and are vulnerable to further resource loss (Hobfoll, 2001). In this sense, chronic exposure to insufficient job resources may hamper individuals' energy and dedication and contribute to psychological distress.

Thus, in the JD-R model, it is not only change that matters; stability may affect work outcomes as well (cf. De Lange, Taris, Kompier, Houtman, & Bongers, 2002; De Lange et al., 2004). However, this assumption is difficult to test using a variable-centered approach (Bergman & Trost, 2006). Contrary to the variable-centered approach, a person-centered approach seeks to uncover dynamic patterns related to a phenomenon of interest by identifying subgroups within heterogeneous samples that share common profiles (Bergman & Andersson, 2010). On the basis of the clustering of salient factors related to a phenomenon, a heterogeneous sample can be divided into subgroups that share common patterns (Knisely & Draucke, 2016). With a focus on the dynamics of these subgroups, a person-centered approach thus allows for examining the developmental trajectories of different subgroups with respect to specific variables.

In previous JD-R research that used the variable-centered approach, multigroup invariance analysis was employed to investigate particular constructs across different occupations (cf. Demerouti et al., 2001a; Schaufeli et al., 2004). The current study focuses on Chinese police officers and nurses. The police culture tends to be hierarchical and masculine, and officers tend to engage in activities that involve hazardous situations. Conversely, nurses have a heritage of constructive cultural values resulting from feministic supportive values, and they often engage in activities that involve all sorts of standardized practices. When dynamic patterns are examined using the person-oriented approach, it would seem particularly rewarding to take a holistic view to focus on exposure subgroups in specific occupations. Such research may shed more light on the contextual mechanisms (e.g., across-time changes in demands and resources) that could account for well-being outcomes. Building on the COR theory, this study therefore builds on the JD-R model to investigate employee well-being (burnout and work engagement) as a function of change and stability in demands and resources.

1.3 | Study hypotheses

On the basis of the reasoning above, we hypothesized eight additive effects of different exposure levels of job demands and job resources on the across-time development of work engagement and burnout. Four hypotheses (Hypotheses 1–4) relate to the effects of stable job conditions, whereas Hypotheses 5–8 focus on the effects of change in demands and resources.

Hypothesis 1. *Chronic exposure to high job demands (H-Hd, for high to high demands) is associated with an increase in burnout (1a) and a decrease in work engagement (1b).*

Hypothesis 2. *Chronic exposure to high job resources (H-Hr, for high to high resources) is associated with a decrease in burnout (2a) and an increase in work engagement (2b).*

Hypothesis 3. *Chronic exposure to low job demands (L-Ld, for low to low demands) is associated with an increase in burnout (3a) and a decrease in work engagement (3b).*

Hypothesis 4. *Chronic exposure to low job resources (L-Lr, for low to low resources) is associated with an increase in burnout (4a) and a decrease in work engagement (4b).*

TABLE 1 Gender difference and occupation difference in an overall sample, and means (*M*), standard deviations (*SD*s), internal consistencies (Cronbach's alpha on the diagonal), correlations for the study variables for police officers (*N* = 273, upper half) and nurses (*N* = 172, lower half), separately

	Overall sample		Separate samples														
			Nurses		Police officers												
	Gender, *F*(*df* = 1)	Occupation, *F*(*df* = 1)	*M*	*SD*	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. Workload (T1)	0.00	0.00	3.80	1.06	3.95	1.09	**.82/.87**	.57*	.27*	.71*	−.21*	−.12*	.21*	−.13*	.15*	.27*	.17*
2. Emotional load (T1)	6.4*	4.34*	3.91	1.35	3.98	1.43	.56*	**.82/.88**	.48*	.59*	−.27*	−.25*	.11	−.22*	−.00	.10	−.01
3. Interpersonal conflict (T1)	16.20**	0.52	1.82	1.02	2.84	1.33	.39*	.57*	**.82/.91**	.34*	−.09	−.14*	−.22*	−.04	−.20*	−.16*	−.22*
4. Work–family interference T1	1.54	0.03	3.06	1.49	3.55	1.43	.56*	.56*	.51*	**.95/.96**	−.27*	−.18*	.16*	−.17*	.14*	.21*	.13*
5. Develop opportunity (T1)	1.61	0.53	2.67	1.05	2.45	1.35	.06	.01	−.01	−.12	**.83/.90**	.77*	.26*	.51*	.15*	.12*	.08
6. Participate (T1)	0.78	0.04	2.50	1.04	2.30	1.19	.05	.07	.02	−.10	.48*	**.85/.89**	.34*	.55*	.17*	.16*	.13*
7. Feedback (T1)	0.00	0.80	3.74	1.16	3.50	1.32	.14	.05	.06	.06	.43*	.51*	**.81/.86**	.10	.46*	.50*	.45*
8. Control (T1)	0.42	0.07	2.51	1.34	2.39	1.34	.02	−.04	.05	−.05	.45*	.35*	.34*	**.73/.83**	.01	.06	.01
9. Vi (T1)	1.16	1.41	2.51	1.19	3.14	1.37	−.16*	−.26*	−.32*	−.35*	.42*	.15*	.10	.24*	**.80/.85**	.86*	.82*
10. De (T1)	0.00	6.44*	2.24	1.15	2.93	1.36	−.01	−.17*	−.26*	−.27*	.43*	.26*	.18*	.21*	.75*	**.84/.89**	.84*
11. AB (T1)	0.06	4.44*	2.27	1.22	2.88	1.45	−.12	−.25*	−.32*	−.39*	.43*	.24*	.18*	.31*	.83*	.78*	**.85/.87**
12. Ex (T1)	0.04	2.63	3.38	1.27	3.03	1.31	.40*	.37*	.358*	.54*	−.25*	−.22*	−.18*	−.12	−.45*	−.43*	−.48*
13. Cy (T1)	1.54	2.43	2.66	1.45	2.60	1.50	.25*	.31*	.31*	.51*	−.39*	−.16*	−.19*	−.19*	−.57*	−.55*	−.62*
14. Workload (T2)	2.98	4.44*	4.12	.93	4.07	1.06	.45*	.30*	.29*	.34*	.05	.02	.18*	.08	−.20*	−.11	−.18*
15. Emotional load (T2)	3.59	12.67*	4.31	1.24	3.87	1.32	.33*	.46*	.34*	.35*	.01	−.04	.10	.07	−.16*	−.11	−.17*
16. Interpersonal conflict (T2)	8.05*	0.78	2.37	1.05	2.85	1.40	.25*	.36*	.56*	.32*	−.03	−.15	.01	−.00	−.23*	−.18*	−.24*
17 Work–family interference (T2)	4.77*	4.68*	3.60	1.38	3.69	1.38	.37*	.42*	.35*	.53*	−.02	−.10	.05	−.06	−.26*	−.17*	−.26*
18. Develop opportunity (T2)	.04	3.78*	2.30	1.15	2.68	1.12	.02	−.08	−.02	−.08	.27*	.29*	.18*	.23*	.29*	.36*	.35*
19. Participate (T2)	3.41	0.10	2.40	.98	2.75	1.18	.05	.02	.01	−.02	.18*	.34*	.16*	.21*	.12	.26*	.20*
20. Feedback (T2)	0.11	0.94	3.59	1.26	3.46	1.25	.12	.06	−.04	.03	.25*	.32*	.37*	.26*	.13	.24*	.28*
21. Control (T2)	0.40	0.01	2.50	1.10	2.59	.93	.06	.08	.11	.12	.11	.25*	.21*	.21*	.00	.08	.01
22. VI (T2)	0.03	11.48**	2.13	1.12	3.03	1.31	−.09	−.08	−.04	−.15*	.20*	.21*	.15	.16*	.40*	.39*	.41*
23. DE (T2)	0.27	16.01**	2.02	1.23	2.97	1.36	.00	−.04	−.00	−.04	.16*	.13	.12	.13	.30*	.40*	.38*
24. AB (T2)	0.26	6.63*	2.01	1.21	2.85	1.44	−.01	−.10	−.02	−.12	.24*	.15	.13	.19*	.38*	.38*	.43*
25. EX (T2)	0.00	13.94*	4.12	1.38	3.15	1.43	.30*	.32*	.25*	.37*	−.14	−.13	−.04	−.12	−.34*	−.31*	−.41*
26. CY (T2)	0.35	12.76**	3.36	1.62	2.47	1.53	.22*	.26*	.26*	.31*	−.22*	−.19*	−.10	−.18*	−.38*	−.37*	−.45*

*$p < .05$.

**$p < .01$.

TABLE 1 (Continued)

	Separate samples														
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1. Workload (T1)	.53*	.45*	.51*	.30*	.10	.46*	.14*	.18*	.11	.02	.21*	.28*	.17*	.22*	.09
2. Emotional load (T1)	.49*	.44*	.34*	.34*	.20*	.37*	.07	.06	.08	.02	.07	.12*	.09	.19*	.13*
3. Interpersonal conflict (T1)	.26*	.20*	.16*	.32*	.46*	.20*	−.10	−.12	−.12	−.09	−.11	−.09	−.12	.31*	.27*
4. Work–family interference T1	.62*	.50*	.48*	.34*	.15*	.56*	.12	.13*	.07	.02	.14*	.21*	.14*	.31*	.16*
5. Develop opportunity (T1)	−.36*	−.41*	−.11	−.10	−.00	−.15*	.25*	.20*	.05	.11	−.00	−.00	−.05	−.02	−.02
6. Participate (T1)	−.29*	−.31*	−.09	−.14*	−.10	−.19*	.22*	.32*	.11	.17*	.04	.04	.02	−.06	−.06
7. Feedback (T1)	.12	.08	.15*	−.06	−.17*	.11	.34*	.46*	.44*	.25*	.35*	.38*	.36*	−.21*	−.28*
8. Control (T1)	−.19*	−.27*	.10	.16*	.11	−.01	−.04	.07	−.02	.08	.01	−.00	−.06	.21*	.17*
9. Vi (T1)	−.06	−.11	.13*	−.07	−.14*	.18*	.32*	.34*	.32*	.16*	.47*	.50*	.49*	−.20*	−.26*
10. De (T1)	.07	.02	.19*	−.02	−.12	.20*	.34*	.37*	.37*	.17*	.47*	.53*	.51*	−.15*	−.21*
11. AB (T1)	−.04	−.03	.11	−.11	−.19*	.12*	.33*	.34*	.35*	.20*	.49*	.52*	.52*	−.26*	−.31*
12. Ex (T1)	**.87/.90**	.84*	.35*	.28*	.15*	.45*	.03	.12	.12*	.03	.00	.09	.02	.27*	.17*
13. Cy (T1)	.84*	**.90/.91**	.25*	.21*	.07	.38*	.04	.13*	.13*	.07	.06	.10	.09	.15*	.13*
14. Workload (T2)	.29*	.22*	**.83/.85**	.66*	.33*	.73*	−.02	.08	.08	−.03	.03	.15*	.06	.51*	.33*
15. Emotional load (T2)	.28*	.24*	.59*	**.84/.87**	.59*	.66*	−.23*	−.13*	−.06	−.18*	−.13*	−.10	−.16*	.58*	.44*
16. Interpersonal conflict (T2)	.29*	.25*	.35*	.53*	**.83/.92**	.49*	−.32*	−.27*	−.27*	−.37*	−.29*	−.28*	−.32*	.54*	.55*
17 Work–family interference (T2)	.34*	.35*	.56*	.59*	.44*	**.95/.96**	−.11	−.03	−.02	−.15*	−.01	.07	−.00	.59*	.42*
18. Develop opportunity (T2)	−.21*	−.24*	−.02	−.09	−.19*	−.13	**.88/.86**	.71*	.55*	.47*	.61*	.62*	.56*	−.37*	−.46*
19. Participate (T2)	−.09	−.14	.07	−.00	−.27*	−.05	.63*	**.87/.92**	.67*	.54*	.51*	.53*	.51*	−.33*	−.39*
20. Feedback (T2)	−.04	−.11	.14	.09	−.20*	−.05	.36*	.56*	**.85/.88**	.49*	.49*	.51*	.51*	−.31*	−.45*
21. Control (T2)	.01	.01	.12	.10	.05	.03	.44*	.48*	.36*	**.68/.80**	.38*	.42*	.45*	−.31*	−.35*
22. VI (T2)	−.25*	−.34*	−.10	−.21*	−.10	−.17*	.46*	.29*	.20*	.23*	**.75/.84**	.87*	.87*	−.44*	−.54*
23. DE (T2)	−.17*	−.27*	.03	−.11	−.06	−.02	.51*	.40*	.28*	.30*	.72*	**.84/.88**	.88*	−.35*	−.41*
24. AB (T2)	−.19*	−.33*	−.05	−.16*	−.10	−.17*	.50*	.36*	.29*	.29*	.71*	.80*	**.80/.90**	−.47*	−.52*
25. EX (T2)	.41*	.44*	.52*	.61*	.42*	.63*	−.36*	−.27*	−.22*	−.10	−.45*	−.31*	−.46*	**.90/.91**	.84*
26. CY (T2)	.41*	.49*	.35*	.52*	.45*	.51*	−.40*	−.37*	−.31*	−.15*	−.57*	−.44*	−.55*	.86*	**.91/.90**

Hypothesis 5. *Increased exposure to job demands (L-Hd, for low to high demands) is associated with an increase in burnout (5a) and a decrease in work engagement (5b).*

Hypothesis 6. *Increased exposure to job resources (L-Hr) is associated with a decrease in burnout (6a) and an increase in work engagement (6b).*

Hypothesis 7. *Decreased exposure to job demands (H-Ld) is associated with a decrease in burnout (7a) and an increase in work engagement (7b).*

Hypothesis 8. *Decreased exposure to job resources (H-Lr) is associated with an increase in burnout (8a) and a decrease in work engagement (8b).*

Further, four synergistic effects associated with the interplay of job demands and different levels of exposure to job resources were examined (Hypotheses 9–12).

Hypothesis 9. *Chronic exposure to low job resources in a high-demands environment (HHd-LLr, for high to high demands–low to low resources) is associated with an increase in burnout (9a) and a decrease in work engagement (9b).*

Hypothesis 10. *Chronic exposure to high job resources in a high-demands environment (HHd-HHr) is associated with a decrease in burnout (10a) and an increase in work engagement (10b).*

Hypothesis 11. *Increased exposure to job resources in a high-demands environment (HHd-LHr) is associated with a decrease in burnout (11a) and an increase in work engagement (11b).*

Hypothesis 12. *Decreased exposure to job resources in a high-demands environment (HHd-HLr) is associated with an increase in burnout (12a) and a decrease in work engagement (12b).*

2 | METHODS

2.1 | Participants

The data were collected in 2012 and 2013 in a general hospital in Jinhua and a police department of Yongkang city in the eastern part of China. Questionnaires were handed out in staff meetings by administrators in the hospital and by the human resource officer of the police department. The survey was accompanied with a letter explaining the general aim of the study and emphasized the participants' privacy. At the first wave of the study (T1), 234 nurses (78% response) and 466 police officers (93% response) were included. One year later, at Time 2, the survey was only sent to those who had participated at Time 1, resulting in a 74% response rate for the nurses (N = 172 nurses) and a 59% response rate for the police officers (N = 273). The mean age of the nurses was 31.8 years (SD = 9.2); all of them were female. The mean age of the police officers was 36.0 years (SD = 9.2), and this sample included 239 male and 37 female officers.

2.2 | Measures

Job demands were assessed by the Chinese version (Hu, Schaufeli, & Taris, 2011) of the Questionnaire on the Experience and Evaluation of Work (Van Veldhoven, De Jonge, Broersen, Kompier, & Meijman, 2002). The four demands included in the present study were workload (five items; e.g., "Do you have too much work to do?"), emotional demands (three items; e.g., "Are you confronted at your work with situations or events that affect you personally?"), interpersonal conflict (four items; e.g., "How often do you get into arguments with others at work?"), and work–family interference (seven items; e.g., "You have so much to do for work that you cannot meet your household or care tasks at home?"). For all demands, a five-point response scale was used, ranging from 1 (*never*) to 5 (*always*). Higher scores indicated higher levels of job demands. Scores on the four job demands scales were collapsed into one composite factor score (see Section 3).

Job resources were also assessed by subscales of the Chinese version of the Questionnaire on the Experience and Evaluation of Work (Hu et al., 2011; Van Veldhoven et al., 2002), using the same five-point answering format. Four job resources were included: job control (three items; e.g., "Do you have freedom in carrying out your work activities?"), learning opportunities (four items; e.g., "I can develop myself sufficiently within my company"), participation in decision making (seven items; e.g., "Can you participate in decisions affecting issues related to your work ?"), and feedback (three items; e.g., "Does your work provide you with direct feedback on how well you are doing your work?"). Again, scores on the job resources scales were collapsed into one composite factor score.

Burnout was assessed with its two core dimensions (exhaustion and cynicism) in the Chinese version (Hu & Schaufeli, 2011) of the Maslach Burnout Inventory—General Survey (Schaufeli, Leiter, Maslach, & Jackson, 1996). Exhaustion was assessed with five items (e.g., "I feel used up at the end of the workday"), and cynicism with four items (e.g., "I have become less enthusiastic about my work"). All items were scored on a seven-point frequency rating scale ranging from 0 (*never*) to 6 (*daily*). High scores on the exhaustion and cynicism subscales indicate burnout. In the current study, we used a sum score of exhaustion and cynicism to represent burnout.

Work engagement was assessed with the Chinese version (Hu et al., 2011) of the Utrecht Work Engagement Scale (Schaufeli, Bakker, & Salanova, 2006), which taps three underlying dimensions: vigor (three items, e.g., "At my work, I feel bursting with energy"), dedication (three items, including "My job inspires me"), and absorption (three items, e.g., "I get carried away when I am working"). All items are scored on a seven-point rating scale ranging from 0 (*never*) to 6 (*daily*). High scores indicate high levels of work engagement. As recommended by Schaufeli and Bakker (2010), a sum score was used to represent work engagement.

2.3 | Statistical analyses

The IBM SPSS 21 computer program was used for analyzing the data. Table 1 provides the means, standard deviations, reliabilities (Cronbach's alphas), and Pearson correlations for the study variables. The reliabilities of most scales exceeded .70. As two heavy gender-dominated occupations were involved, an overall analysis was conducted using a sample that combined both smaller samples (police officers and nurses) to investigate whether gender as a confounding variable could account for the scores on the study variables. Multivariate analyses with occupation (i.e., police officer and nurse) as a fixed factor and gender as a covariate revealed several significant differences between nurses' and police officers' scores on the study variables (46.15% in total, Table 1), whereas four significant differences between the average scores of males and females on the study variables emerged (15.38% in total).

A principal components analysis with varimax rotation based on the eigenvalues above 1.00 and including all eight job demands and job resources was carried out for each occupational group (nurses and police officers) separately at T1 and T2. For both samples, similar results were obtained, with workload, emotional demands, interpersonal conflict, and work–family interference loading on a job demand component, whereas job control, learning opportunities, participation in decision making, and feedback loaded on a job resources component at T1 and T2, respectively. The only exception was that interpersonal conflict showed a relatively high cross-loading (of −.40) on the job resource component among police officers at T2. The results are displayed in Table 2.

On the basis of the loadings of the items on the first two factors, composite scores for job demands and job resources were computed and standardized to have a mean of zero. The variables measuring job demands and job resources at each of the two waves of the study were classified into two clusters (labeled as *high* and *low*) using *k*-means cluster analysis on the basis of these factor scores. Following the approach of De Lange et al. (2002), four subgroups that differed in their starting point and development of job demands/job resources across time were created. As regards the demands group, comparison of the participants' scores on the T1 and T2 measures of job demands yielded four subgroups that differed in their levels of exposure to job demands over time: (a) a *chronic high-exposure group* (H-H) that included those reporting high job demands at both time points; (b) a *chronic low-exposure group* (L-L) that included participants who reported low demands at both time points; (c) an *increasing-exposure group* (L-H) that included those with low demands at T1 and high demands at T2; and (d) a *decreasing-exposure group* (H-L) that included those reporting high demands at T1 and low demands at T2. With the same procedure, four similar subgroups were created for job resources. Table 3 presents the means for the different demands and resources exposure groups as well as the T1–T2 changes in the study variables, for nurses and police officers separately.

To study the role of being exposed to particular demands/resource combinations, four *joint-exposure subgroups* were formed for each separate sample. As theoretically the effect of resources in a highly demanding environment is most interesting (e.g., Bakker & Demerouti, 2007; De Lange et al., 2002), we focused on the stable high-demands groups only (*N*s were 63 for the nurses and 114 for

TABLE 2 Factor loadings of various job demands and job resources for nurses and police officers

	Nurses (*n* = 172)		Police officers (*n* = 273)	
	Component 1	Component 2	Component 1	Component 2
Workload (T1)	.78		.85	
Emotional demands (T1)	.84		.83	
Interpersonal conflict (T1)	.76		.53	
Work–family interference (T1)	.83		.87	
Participate in decision (T1)		.78		.89
Learning opportunities (T1)		.79		.84
Feedback (T1)		.75		.55
Control (T1)		.69		.70
Eigenvalue	2.58	2.30	2.63	2.34
Explained variance (%)	32.40	28.53	32.82	29.24
Workload (T2)	.79		.86	
Emotional demands (T2)	.86		.87	
Interpersonal conflict (T2)	.71		.65	-.40
Work–family interference (T2)	.82		.89	
Participate in decision (T2)		.88		.89
Learning opportunities (T2)		.77		.82
Feedback (T2)		.74		.83
Control (T2)		.71		.73
Eigenvalue	2.57	2.49	2.75	2.88
Explained variance (%)	32.18	31.11	34.32	35.94

Note. Only factor loadings of .30 and over are displayed.

TABLE 3 Means (*M*), standard deviations (*SD*s), and univariate analysis of the studied variables for four demand exposure groups and four resource exposure groups among nurses and police officers, at two points in time

		Nurses (*N* = 172)						Police officers (*N* = 273)					
			T1		T2				T1		T2		
Variables	Groups	*N*	*M*	*SD*	*M*	*SD*	Δ*M*	*N*	*M*	*SD*	*M*	*SD*	Δ*M*
						Demands group							
Job demands	H-H	63	0.80	0.60	0.93	0.55	−1.60	114	0.79	0.67	0.77	0.59	0.21
	H-L	41	0.42	0.50	−0.47	0.36	9.22***	45	0.35	0.56	−0.71	0.41	8.94***
	L-H	17	−0.85	0.38	0.61	0.45	−8.97***	32	−0.80	0.61	0.77	0.63	−12.04***
	L-L	51	−1.05	0.65	−.98	0.71	−.71	82	−0.97	0.54	−.98	0.55	0.18
F(*df* = 3)			116.04***		127.08***				155.45***		200.64***		155.45***
Job resources	H-H	63	−0.08	0.97	−0.07	1.12	−0.09	114	0.03	1.03	0.11	1.10	5.96***
	H-L	41	0.12	0.96	0.07	0.90	0.34	45	0.11	0.94	0.24	1.09	−0.75
	L-H	17	−0.02	0.90	−0.24	1.04	0.79	32	−0.18	1.18	−0.24	0.96	0.28
	L-L	51	0.01	1.11	0.11	0.92	−0.71	82	−0.04	0.92	−0.19	0.76	1.53
F(*df* = 3)			.33		.68				.60		3.00*		
Burnout	H-H	63	7.51	2.63	9.16	2.37	−4.24***	114	7.08	2.70	6.58	3.04	1.27
	H-L	41	6.13	2.49	7.05	2.25	−2.06	45	5.20	2.44	4.64	2.19	1.28
	L-H	17	4.99	1.69	8.91	2.55	−8.54***	32	4.56	2.69	6.90	2.71	−4.38***
	L-L	51	4.52	1.83	5.30	2.54	−2.39*	82	4.28	1.68	4.32	2.11	−0.14
F(*df* = 3)			17.25***		26.53**				25.32***		16.43***		
Work engagement	H-H	63	5.66	3.24	5.55	3.41	0.23	114	9.54	4.64	9.26	4.62	0.88
	H-L	41	7.22	3.35	6.12	3.04	2.01	45	8.32	3.22	9.19	3.37	−1.59
	L-H	17	7.65	2.44	5.24	2.65	4.36***	32	8.94	4.57	7.61	3.34	1.58
	L-L	51	8.34	2.99	7.27	3.15	2.61*	82	8.46	2.81	8.57	3.28	−0.29
F(*df* = 3)			7.29***		3.35*				1.68		1.72		
						Resources group							
Job demands	H-H	45	0.08	0.83	0.09	0.93	−0.07	55	0.08	1.02	0.05	0.85	0.22
	H-L	31	0.03	1.01	0.04	1.15	−0.07	70	−0.12	0.88	−0.07	1.04	−0.55
	L-H	43	0.08	1.06	−0.04	0.99	0.86	34	0.64	1.10	0.21	0.75	2.50
	L-L	53	−0.16	1.08	−0.07	1.00	−0.66	114	−0.16	0.96	−0.05	1.10	−1.19
F(*df* = 3)			.64		.25				2.52		.81		
Job resources	H-H	45	1.04	0.67	1.04	0.60	0.01	55	1.10	0.69	0.99	0.47	1.36
	H-L	31	0.66	0.49	−0.82	0.57	11.78***	70	0.73	0.59	−0.30	0.58	9.52***
	L-H	43	−0.56	0.55	0.54	0.48	−10.39***	34	−0.66	0.28	1.31	0.69	−13.81***
	L-L	53	−0.82	0.62	−0.84	0.56	0.23	114	−0.78	0.53	−0.68	0.66	6.33***
F(*df* = 3)			104.52***		129.00***				195.49***		137.08***		
Burnout	H-H	45	5.57	5.57	2.66	6.47	2.87	55	5.06	2.39	4.93	2.31	.36
	H-L	31	5.69	5.69	2.67	8.09	3.32	70	4.93	2.15	6.32	2.75	−4.30***
	L-H	43	6.36	6.36	2.52	7.00	2.37	34	8.12	3.38	3.20	1.90	6.81***
	L-L	53	6.41	6.41	2.58	8.38	2.78	114	5.60	2.50	6.25	2.90	−2.51*
F(*df* = 3)			1.25		4.61**				7.91***		11.57***		
Work engagement	H-H	45	8.52	3.66	7.97	3.44	1.18	55	10.20	2.83	11.13	3.40	−2.01*
	H-L	31	7.15	3.35	4.33	2.61	4.76***	70	9.49	2.87	7.90	2.83	4.18***
	L-H	43	6.14	3.07	6.99	3.37	−1.48	34	12.50	4.84	13.88	3.39	−2.17*
	L-L	53	6.39	2.71	5.04	2.20	3.56**	114	6.94	3.62	6.82	2.94	0.34
F(*df* = 3)			5.11**		13.39***				14.67***		34.58***		

Note. Information on the specific cutoff points for the various exposure groups can be obtained from the corresponding author. H-H = chronic high exposure group (high–high); H-L = decreasing exposure group (high–low); L-H = increasing exposure group (low–high); L-L = chronic low exposure group (low–low).

**$p < .01$.

***$p < .001$.

the police officers). These two groups were divided into four resources subgroups each, with roughly 25% of the observations in the high-demands group in each of the four subgroups at both time points. For each sample, the four subgroups were labeled as "high demands and high resources exposure group" (HHd-HHr), "high demands and decreased resources exposure group" (HHd-HLr), "high demands and increased resources exposure group" (HHd-LHr), and "high demands and low resources exposure group" (HHd-LLr). Table 4 presents the means and univariate findings for the study variables as a function of the exposure group and sample.

3 | RESULTS

3.1 | Additive job demands/job resources exposure groups

We examined whether there were differences in levels of burnout and engagement, depending on the exposure to job demands and job resources. The data were analyzed using a 2 (time: Time 1 vs. Time 2) × 4 (group: H-H, H-L, L-H, and L-L exposure groups) repeated-measures ANOVA with time as a within-participants factor and group

TABLE 4 Means (*M*), standard deviations (*SD*s), and univariate analysis of the studied variables in four joint-exposure groups in a high-demands environment among nurses and police officers

		Nurses (*N* = 63)						Police officers (*N* = 114)					
			T1		T2				T1		T2		
Variables	Groups	*N*	*M*	*SD*	*M*	*SD*	Δ*M*	*N*	*M*	*SD*	*M*	*SD*	Δ*M*
Job demands	HHd-HHr	17	0.82	0.51	0.97	0.59	−1.03	34	0.54	0.11	0.68	0.10	−1.41
	HHd-HLr	14	0.60	0.47	0.94	0.41	−2.55*	6	1.14	0.25	1.33	0.24	−0.47
	HHd-LHr	15	1.10	0.69	0.98	0.59	0.60	43	1.07	0.10	0.72	0.09	3.26**
	HHd-LLr	17	0.68	0.64	0.86	0.60	−1.12	31	0.58	0.11	0.82	0.11	−2.04
F(*df* = 3)			2.11		0.15				6.47***		2.30		
Job resources	HHd-HHr	17	0.85	0.62	1.00	0.64	−0.91	34	1.24	0.09	0.61	0.12	5.97***
	HHd-HLr	14	0.54	0.42	−0.92	0.67	6.76***	6	1.26	0.21	−0.90	0.28	7.82**
	HHd-LHr	15	−0.66	0.39	0.65	0.62	−7.46***	43	−0.49	0.08	0.77	0.11	−7.45**
	HHd-LLr	17	−1.01	0.71	−1.06	0.57	0.27	31	−0.79	0.09	−1.16	0.12	3.07**
F(*df* = 3)			41.98***		46.17***				117.39***		58.44***		
Burnout	HHd-HHr	17	6.84	2.71	7.93	2.59	−1.62	34	5.53	0.41	6.15	0.45	−1.52
	HHd-HLr	14	7.25	2.29	10.49	1.27	−4.10**	6	5.63	0.97	10.91	1.07	−6.12***
	HHd-LHr	15	7.66	2.67	7.93	2.32	−0.34	43	8.61	0.36	5.15	0.40	4.89***
	HHd-LLr	17	8.25	2.80	10.38	1.72	−2.80*	31	6.95	0.43	8.18	0.47	−2.66*
F(*df* = 3)			.87		7.17***				11.50***		13.74***		
Work engagement	HHd-HHr	17	6.96	3.37	7.14	3.79	−0.23	34	10.64	0.71	9.82	0.68	1.36
	HHd-HLr	14	5.98	3.89	3.69	2.79	2.24*	6	11.72	1.69	8.78	1.62	2.33
	HHd-LHr	15	4.71	2.75	6.67	3.59	−1.57	43	10.95	0.63	11.57	0.61	−1.40
	HHd-LLr	17	4.92	2.67	4.49	2.24	0.68	31	5.97	0.74	5.52	0.71	0.63
F(*df* = 3)			1.74		4.28**				10.74***		14.27***		

Note. HHd-HHr = high–high demands/high–high resources; HHd-HLr = high–high demands/high–low resources; HHd-LHr = high–high demands/low–high resources; HHd-LLr = high–high demands/low–low resources.

**$p < .01$.

***$p < .001$.

as a between-participants factor. The analyses were conducted for nurses and police officers separately. Special attention was given to the Time × Group interaction effect due to its direct relevance to our hypotheses.

3.2 | Exposure to job demands (nurses)

Table 5 shows a significant Time × Group interaction effect for burnout, suggesting that the four exposure groups differed in terms of their levels of burnout across T1 and T2. No interaction effect was observed for exposure to demands and work engagement, suggesting that differential exposure to job demands is unrelated to levels of engagement across time. A paired *t* test (see values of Δ*M* in Table 3) revealed that burnout levels of the H-Hd exposure group, $t(62) = -4.24$, $p < .001$; the L-Hd exposure group, $t(16) = -8.45$, $p < .001$; and the L-Ld exposure group, $t(50) = -2.39$, $p < .05$, increased significantly from T1 to T2 (Hypotheses 1a, 3a, and 5a confirmed).

3.3 | Exposure to job resources (nurses)

Significant Time × Group interaction effects for burnout and work engagement revealed that the four exposure groups differed in their

TABLE 5 Repeated-measures ANOVA: comparison of burnout and work engagement among exposure to demands groups and exposure to resources groups among nurses and police officers

	Exposure to demands						Exposure to resources					
	Groups		Time		Groups × Time		Groups		Time		Groups × Time	
	F(*df* = 3)	Partial η^2	*F*(*df* = 1)	Partial η^2	*F*(*df* = 3)	Partial η^2	*F*(*df* = 3)	Partial η^2	*F*(*df* = 1)	Partial η^2	*F*(*df* = 3)	Partial η^2
Nurses (*N* = 172)												
Burnout	29.92***	0.35	60.30***	0.26	6.39***	0.10	2.87*	0.05	47.17***	0.22	3.64*	0.06
Engagement	6.47***	0.10	16.21**	0.09	2.36	0.04	9.11***	0.14	15.02***	0.08	8.43***	0.13
Police officers (*N* = 273)												
Burnout	32.86***	0.27	1.99	0.01	6.23***	0.07	2.38	0.03	14.81***	0.05	38.14***	0.30
Engagement	1.51	0.02	0.39	0.00	2.37	0.03	56.14***	0.39	0.40	0.00	7.39***	0.08

Note. All *F*s for the nurses have 164 *df*s for their error term. All *F*s for the police officers have 265 *df*s for their error term.

*$p < .05$.

**$p < .01$.

***$p < .001$.

levels of burnout and work engagement across T1 and T2 (see Table 5). Paired *t* tests revealed that the burnout level of the L-Lr exposure group, $t(52) = -5.30$, $p < .001$, and the H-Lr exposure group, $t(30) = -4.13$, $p < .001$, increased significantly from T1 to T2 (see values of ΔM in Table 3; Hypotheses 4a and 8a confirmed). Paired *t* tests revealed that work engagement in the L-Lr exposure group, $t(52) = 3.56$, $p < .01$, and in the H-Lr exposure group, $t(30) = 4.76$, $p < .001$, decreased significantly from T1 to T2 (see values of ΔM in Table 3; Hypotheses 4b and 8b confirmed). Unexpectedly, the burnout level of the H-Hr exposure group, $t(44) = -2.28$, $p < .05$, increased significantly from T1 to T2.

3.4 | Exposure to job demands (police officers)

Table 5 displayed significant Time × Group interaction effects for burnout, meaning that the four exposure groups differed in their levels of burnout across T1 and T2. Paired *t* tests revealed that the level of burnout in the L-Hd exposure group increased significantly from T1 to T2, $t(31) = -4.38$, $p < .001$ (see Table 3; Hypothesis 5a confirmed), and that no significant change in work engagement was found for the exposure groups.

3.5 | Exposure to job resources (police officers)

Significant Time × Group interaction effects for burnout and work engagement showed that the four exposure groups differed in the development of burnout and work engagement across time (see Table 5). Paired *t* tests (see Table 3) revealed that the levels of burnout in the H-Lr exposure group, $t(69) = -4.30$, $p < .001$, and the L-Lr exposure group, $t(113) = -2.51$, $p < .05$, increased significantly from T1 to T2 (Hypotheses 4a and 8a confirmed). The burnout level in the L-Hr exposure group decreased significantly, $t(33) = 6.81$, $p < .001$ (Hypothesis 6a confirmed). Further, the levels of engagement of the L-Hr exposure group and the H-Hr exposure group increased significantly across time, $t(33) = -2.17$, $p < .05$; $t(54) = -2.01$, $p < .05$, whereas that of the H-Lr exposure group decreased from T1 to T2, $t(69) = 4.18$, $p < .001$ (Hypotheses 2b, 6b, and 8b confirmed).

3.6 | The role of resources in a high-demands environment

The joint effects for the four job resources groups exposed to high demands were separately examined for nurses and police officers. The data were analyzed using a 2 (time: Time 1 vs. Time 2) × 4 (group: HHd-HHr, HHd-HLr, HHd-LHr, and HHd-LLr exposure groups) repeated-measures ANOVA with time as a within-participants factor and group as a between-participants factor.

3.6.1 | Nurses

Significant Time × Groups interaction effects for burnout and work engagement show that the four joint-exposure groups differed in their levels of burnout and work engagement across time (see Table 6). Paired *t* tests revealed that the burnout level of the HHd-HLr exposure group, $t(13) = -4.10$, $p < .01$, and the HHd-LLr exposure group, $t(16) = -2.80$, $p < .05$, increased significantly across time (see Table 4; Hypotheses 9a and 12a confirmed). Further, the level of engagement of the HHd-HLr exposure group decreased significantly from T1 to T2, $t(13) = 2.24$, $p < .05$ (Hypothesis 12b confirmed).

3.6.2 | Police officers

Significant Time × Group interaction effects for burnout show that the four joint exposure groups differed in their levels of burnout across time (Table 6). Paired *t* tests revealed that the burnout level of the HHd-LHr exposure group, $t(42) = 4.89$, $p < .001$, decreased significantly, whereas the levels of burnout in the HHd-HLr exposure group, $t(5) = -6.12$, $p < .001$, and the HHd-LLr exposure group, $t(30) = -2.66$, $p < .05$, increased significantly (see Table 4; Hypotheses 9a, 11a, and 12a confirmed).

4 | DISCUSSION

Combining two perspectives (the JD-R model and COR theory), the current study relied on a person-centered approach to make a unique effort to explore the idea that both change in and stability of work characteristics may result in changes in employee well-being. Table 7 summarizes the results for the study hypotheses. Below, we discuss the most interesting findings of this study.

4.1 | Additive job demands/resources exposure groups—exposure to change

Generally, we expected that positive (negative) changes in terms of job demands and job resources would be associated with correspondingly higher (lower) levels of burnout and lower (higher) levels work

TABLE 6 Repeated-measures ANOVA: comparison of burnout and work engagement among joint-exposure groups in a high-demands environment among nurses and police officers

	Nurses ($N = 63$)						Police officers ($N = 114$)					
	Groups		Time		Groups × Time		Groups		Time		Groups × Time	
	$F(df = 3)$	Partial η^2	$F(df = 1)$	Partial η^2	$F(df = 3)$	Partial η^2	$F(df = 3)$	Partial η^2	$F(df = 1)$	Partial η^2	$F(df = 3)$	Partial η^2
Burnout	3.90*	0.17	20.07***	0.25	2.79*	0.12	6.30**	0.15	4.49*	0.04	19.85***	0.53
Engagement	2.84*	0.13	0.10	0.00	3.33*	0.15	14.62***	0.29	4.35*	0.04	2.49	0.06

Note. All *F*s for the nurses have 59 *df*s for their error term. All *F*s for the police officers have 110 *df*s for their error term.

*$p < .05$.

**$p < .01$.

***$p < .001$.

TABLE 7 Summary of the results of the present study

Study hypotheses		Nurses	Police officers
1.	Chronic exposure to high job demands (H-Hd) is associated with an increase in burnout (1a) and a decrease in work engagement (1b).	H1a +, H1b −	H1a −, H1b −
2.	Chronic exposure to high job resources (H-Hr) is associated with a decrease in burnout (2a) and an increase in work engagement (2b).	H2a +, H2b −	H2a −, H2b +
3.	Chronic exposure to low job demands (L-Ld) is associated with an increased in burnout (3a) and a decrease in work engagement (3b).	H3a +, H3b −	H3a −, H3b −
4.	Chronic exposure to low job resources (L-Lr) is associated with an increase in burnout (4a) and a decrease in work engagement (4b).	H4a +, H4b +	H4a +, H4b −
5.	Increased exposure to job demands (L-Hd) is associated with an increase in burnout (5a) and a decrease in work engagement (5b).	H5a +, H5b −	H5a +, H5b −
6.	Increased exposure to job resources (L-Hr) is associated with a decrease in burnout (6a) and an increase in work engagement (6b).	H6a −, H6b −	H6a +, H6b +
7.	Decreased exposure to job demands (H-Ld) is associated with a decrease in burnout (7a) and an increase in work engagement (7b).	H7a −, H7b −	H7a −, H7b −
8.	Decreased exposure to job resources (H-Lr) is associated with an increase in burnout (8a) and a decrease in work engagement (8b).	H8a +, H8b +	H8a +, H8b +
9.	Chronic exposure to low job resources in a high-demands environment (HHd-LLr) is associated with an increase in burnout (9a) and a decrease in work engagement (9b)	H9a +, H9b −	H9a +, H9b −
10.	Chronic exposure to high job resources in a high-demands environment (HHd-HHr) is associated with a decrease in burnout (10a) and an increase in work engagement (10b).	H10a −, H10b −	H10a −, H10b −
11.	Increased exposure to job resources in a high-demands environment (HHd-LHr) is associated with a decrease in burnout (11a) and an increase in work engagement (11b).	H11a −, H11b −	H11a +, H11b −
12.	Decreased exposure to job resources in a high-demands environment (HHd-HLr) is associated with an increase in burnout (12a) and a decrease in work engagement (12b).	H12a +, H12b +	H12a +, H12b −

Note. + = supported; − = not supported.

engagement (Hypotheses 5–8). These hypotheses received moderate support. Increased exposure to job demands (L-Hd) was associated with significant increases in burnout among both samples, whereas increased exposure to resources (L-Hr) was associated with a significant decrease in burnout and a significant increase in work engagement only among police officers. Further, decreased exposure to job resources (H-Lr) was associated with significant increases in burnout and significant decreases in work engagement among both nurses and police officers. These results support the idea that increasing job demands and decreasing job resources evoke a health-impairing process of energy depletion that leads to burnout, whereas increasing job resources triggers a motivational process that leads to high work engagement (Schaufeli & Bakker, 2004).

The fact that in both samples burnout increased whereas work engagement decreased for the H-Lr group implies that those who are vulnerable to resource loss are likely to experience poorer well-being in the future. In addition, the effect of increased exposure to job demands (L-Hd) on burnout was positive and significant, whereas the effect of experiencing an L-Hd trajectory on work engagement was nonsignificant in both samples. Apparently, the L-Hd trajectory requires high effort expenditure that accordingly increases physiological and psychological costs, which leads to increasing levels of burnout. The nonsignificant effect of the L-Hd trajectory on work engagement suggests that even a pressure-laden, anxiety-producing experience in highly demanding settings can be viewed as rewarding and worth the discomfort involved due to its potential for gains. Similarly, the trajectories involving decreasing and stable exposure to demands (H-Ld and H-Hd) did not deteriorate motivation significantly in both samples. This replicates earlier cross-sectional and standard-error-of-the-mean-based findings that the effect of job demands on work engagement was nonsignificant (Hakanen et al., 2006; Schaufeli & Bakker, 2004).

4.2 | Additive job demands/resources exposure groups—exposure to stability

Our study showed that chronic exposure to low job resources (the L-Lr trajectory) was associated with a significant increase in burnout among both nurses and police officers and a significant decrease in work engagement among nurses. Similarly, chronic exposure to high job demands (H-Hd) was associated with a significant increase in burnout among nurses. One explanation is that burnout is the end state of a process of energy depletion (Hobfoll & Freedy, 1993). When recovery from the adverse effects of long-term exposure to high job demands is impossible or incomplete, resources may further be depleted, eventually resulting in burnout. These findings challenge the notion that changes in the independent variable are needed to observe changes in the outcome variables. Apparently, prolonged exposure to a particular unfavorable constellation of job characteristics can also result in adverse changes in outcomes such as engagement and burnout. This finding is consistent with the idea of loss spirals (Hakanen et al., 2006), in that it appears that those who were already at the highest level of disadvantage were most adversely impacted by further losses. Hence, it seems that accumulative effects of exposure to continuously high job demands and high job resources exist, resulting in poor and superior well-being, respectively.

An interesting finding is that chronic exposure to high job resources (H-Hr) did not lead to a decrease in burnout or an increase in work engagement among both nurses and police officers. Indeed,

burnout increased significantly for the nurses in this group. Further, a change in resource levels (H-Lr and L-Hr) influenced individual's well-being significantly. According to the COR theory, changes in resource levels, rather than stable or chronic situations, influence peoples' health and well-being (Hobfoll, 2001). This might be explained by the "resource curse" in that people adapt to having abundant resources, resulting in lower motivation to work hard to obtain more resources. Similar to nurses who were exposed to high job resources (H-Hr), our study found that nurses who were exposed to chronic low job demands (L-Ld) experienced a significant increase in burnout. One explanation may be that employees experiencing chronic low job demands will have little challenge in their jobs, which will reduce their opportunities for success and will thwart their intrinsic motivation (cf. De Lange et al., 2002, 2004). This could lead to a depletion of mental energy, eventually leading to burnout.

4.3 | Joint exposure groups in a highly demanding environment

The combination of a highly demanding environment with a chronic exposure to low job resources or with exposure to decreasing resources (HHd-LLr and HHd-HLr groups) was associated with a significant increase in burnout among both nurses and police officers, whereas among nurses the combination of a highly demanding environment with decreased job resources (the HHd-LLr group) was associated with a significant decrease in work engagement. Working in this high-demands environment might have placed employees in an unfavorable situation that requires the investment of psychological energy resources and offers little opportunity for replenishment of these resources. However, gaining resources in a highly demanding environment (HHd-LHr) was related to a significant decrease in burnout among police officers. In addition, our study did not find that gaining resources in a high-demands environment (HHd-LHr) was associated with work engagement. It is possible that loss experiences in a high-demands environment evoke avoidance and loss prevention strategies, rather than to actively seek for new opportunities for resource gain (Hu et al., 2011).

4.4 | The effects of demands/resources on burnout and work engagement

The basic principle of the COR theory is that stress emerges when people experience or anticipate resource loss or fail to gain resources after significant resource investment. In this view, burnout is the end state of a long-term process of resource loss that gradually develops over time and that depletes one's energy resources (Hobfoll & Freedy, 1993). Conversely, engagement is the result of the process of real or anticipated resource gain that enhances one's energy resources. Consistent with this view, our study shows that experiencing an increase in job demands or a decrease in job resources resulted in relatively strong changes in burnout and work engagement, as compared to the effects of experiencing a decrease of demands or an increase of resources. Also, note that our study found 15 significant effects of job demands or job resources on well-being (burnout and work engagement) among nurses and police officers in total (see Table 3) and four significant joint effects of job resources combined with high job demands on burnout (Table 4). Of these effects, 16 were negative for increasing burnout or decreasing work engagement, whereas only three were positive for increasing work engagement or decreasing burnout. This is consistent with the view that people are more sensitive to losses than to gains (Hobfoll, 1989).

4.5 | About the nature of the nurses and police officers samples

Some occupations have become segregated on the basis of gender and may be considered as typically masculine or feminine. The samples employed in the current study (police officers and nurses) are examples of such gender-segregated professions. Speculation that segregation affects well-being is not uncommon (Maslach, Schauefeli, & Leiter, 2001). However, such speculations are typically exaggerated beyond the true sizes of gender differences in well-being, often to the disadvantage of the female-dominated professions (Matlin, 2004). A meta-analysis of the relationship between gender and burnout revealed that burnout differences between masculine- and feminine-dominated occupations are minimal (Purvanova & Muros, 2010). A study on workaholism also revealed nonsignificant gender differences (Taris, Van Beek, & Schaufeli, 2012). Our study revealed that most differences on job-related characteristics and well-being could be linked to the occupation, with only a minor role for gender (Table 1). Given the robust consistency of previous research findings, it is reasonable to attribute differences in well-being between nurses and police officers to their different work environments, rather than to gender. This study showed that police and nurses share similar patterns of results to some degree, such as chronic low job resources that increase nurses and polices' burnout levels and decreased resources that decrease nurses and polices' work engagement levels. This study revealed a few occupation-specific results. For instance, the negative effect of job demands on well-being is stronger for the nurses than for the police officers. This might be due to the New Health Care Reform Plan conducted in China, which aims to improve medical services to ensure both quality and efficiency in the health-care sector. This reform put high job demands on nurses, both in terms of patient care and in relation to new medical technology. This might have been responsible for our finding that job demands had stronger adverse effects for nurses than for police officers.

4.6 | Study limitations

Although this study used a longitudinal design, this design involved only two waves. This means that the gain and loss spirals suggested by the JD-R model could only to a limited degree be examined; that is, complete spirals (e.g., low resources → higher burnout → even lower resources) could not be observed. Moreover, some of the main analyses involved the comparison of discrete groups of employees. In these cases, the underlying concepts (the demands and resources reported by these employees) had been measured at a higher measurement level; that is, the creation of these groups led to a loss of information and statistical power. Unfortunately, given the person-centered

focus of the current manuscript, this was unavoidable. Similarly, in this study, many statistical comparisons were made, increasing the risk that some of the effects found here do not generalize to the population. To some degree, this risk can be mitigated by adjusting the alpha level (e.g., to $p < .01$ rather than $p < .05$). However, Tables 3–6 show that even when employing a more rigid significance level (e.g., $p < .001$), most findings reported in this study would still hold up. Thus, there is no reason to assume that a sizeable part of the findings reported in this study is due to capitalization on chance. In addition, the numbers of participants in several of the exposure subgroups in Tables 3 and 4 are relatively small (*Ns* < 80). Although the variables used to create these subgroups showed an accepted internal consistency as well as test–retest reliability in our two-wave survey, this implies that lack of statistical power may have resulted in conservative estimates of the differences among groups and that findings may possibly have been biased by the presence of influential cases. Therefore, it would be worthwhile for future research to replicate the current findings in a larger sample.

4.7 | Study implications

Several theoretical and practical implications emerge from this study's findings. From a theoretical point of view, our study sheds more light on the dual-process assumption of the JD-R model by focusing on the dynamic and contextual factors affecting these processes (e.g., across-time changes in demands and resources). This study revealed not only that changes in demands and resources can affect well-being but also that steady exposure to particular levels of demands and resources may result in positive or negative changes in the outcome variables. On the one hand, this underlines the notion that dynamic processes should not be examined using variable-centered approaches only, as such approaches cannot capture such processes fully. On the other hand, it is intriguing to see that different levels of exposure to demands and resources can have very different effects on the outcome variables: For example, steady exposure to high levels of demands apparently has very different effects from steady exposure to low levels of demands. Clearly, these complex processes cannot be captured fully by the variable-centered statistical methods that have been used to date for testing the JD-R model.

From a practical point of view, our study shows that employees who are able to accumulate resources report higher levels of well-being than others (e.g., those experiencing loss spirals). This also holds implications for managers. For example, they should especially focus on employees holding high demands or low resources jobs or on those who transfer to such jobs. When demands are high, mangers can provide coaching and support on the spot or provide training to learn coping skills for dealing with high demands.

In conclusion, this study provided support for the assumption that different levels of exposure to job demands and job resources induce different levels of well-being. The changes framed in terms of the loss spiral apparently weigh more heavily than the changes framed as the gain spiral. The increase of job demands would be a more robust determinant of burnout, whereas the loss of job resources is a determinant of not only burnout but also work engagement.

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