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Extending the challenge-hindrane model of occupational stress: The role of appraisal

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Abstract

Interest regarding the challenge-hindrane occupational stress model has increased in recent years, however its theoretical foundation has not been tested. Drawing from the transactional theory of stress, this study tests the assumptions made in past research (1) that workload and responsibility are appraised as challenges and role ambiguity and role conflict are appraised as hindrances, and (2) that these appraisals mediate the relationship between these stressors and outcomes (i.e., strains, job dissatisfaction, and turnover intentions). For a sample of 479 employees, we found that although workload, role ambiguity, and role conflict could be appraised primarily as challenges or hindrances, they could also simultaneously be perceived as being both to varying degrees.

Support was also found for a model in which primary appraisal partially mediated the stressor-outcome relationship.

Keywords

Stressors, Appraisals, Strains, Job satisfaction, Turnover intentions

Research has generally supported the proposition that unfavorable working conditions (stressors) negatively influence psychological and physical health (strains; e.g., reviews by Jex and Yankelevich, 2008, Semmer et al., 2005), employee attitudes, and work behaviors (e.g., Boyd et al., 2009, Simona et al., 2008). However, there are some studies that have not shown this result (e.g., Beehr et al., 2001, Dwyer and Ganster, 1991). Because of these inconsistent findings, research on occupational stress has begun to acknowledge that work stressors can be both 'good' and 'bad' with regard to their effects on performance (e.g., LePine, Podsakoff, & LePine, 2005), work attitudes (e.g., Boswell, Olson-Buchanan, & LePine, 2004) and withdrawal behaviors (e.g., Podsakoff, LePine, & LePine, 2007). Similar distinctions between different types of stressors has long been recognized (i.e., eustress and distress; Selye, 1974) but not often studied in the work stress literature. In recent work this distinction is most clearly recognized in the *challenge-hindrance* occupational stressor model (Cavanaugh, Boswell, Roehling, & Boudreau, 2000). In this model, stressors that are thought to have a favorable relationship to some outcomes are considered challenge stressors, and those that are thought to have an unfavorable relationship to outcomes are considered hindrance stressors. A number of empirical studies have supported the major propositions in the model (e.g., Pearsall, Ellis, & Stein, 2009) and it is growing in prominence in the research literature (e.g., Webster, Beehr, & Christiansen, 2010).

The challenge-hindrance occupational stress model draws heavily from the transactional theory of stress found in the more general (non-work) stress literature (Lazarus & Folkman, 1984). In this cognitive theory of stress, a person's evaluation of the environment, or *primary appraisal*, plays a critical role in the stress process. Primary appraisal is thought to determine if an event or aspect of the environment is perceived as a challenge or a hindrance, and it is considered to be one of the main psychological mechanisms linking stressors to outcomes. Although primary appraisal is implicit in the challenge-hindrance model, none of the empirical research using the model has directly measured it. Rather, it has been assumed, *a priori*, that certain stressors would be experienced as either challenges or hindrances (e.g., LePine et al., 2005), but no study has directly examined employees' primary appraisal as the underlying theoretical mechanism linking stressors to outcomes. The purpose of the present study is to extend the challenge-hindrance occupational stress model by examining the role of appraisal in the stressor-outcome process. We begin by testing the operational assumption made in past research that certain stressors (role conflict, role ambiguity, workload, and responsibility) are uniformly and exclusively appraised as either challenges or hindrances. Then we test whether these primary appraisals mediate the relationship between stressors and the outcomes of emotional exhaustion, physical symptoms, job dissatisfaction and turnover intentions as proposed in transactional stress theory.

1. Challenge and hindrance stressors

In the challenge-hindrance occupational stress model, common workplace stressors were allocated into two categories. Challenge stressors included demands that, while strain-provoking, may also create especially high performance opportunities and therefore, a strong sense of accomplishment if one is able to overcome the difficult situations they present. Hindrance stressors, on the other hand, consisted of demands that are more likely to interfere with and thwart the attainment of personal goals and development (Cavanaugh et al., 2000). At best, overcoming these hindrances only results in adequate performance, and therefore the sense of accomplishment accompanying high performance is missing.

This two-way categorization was accomplished by Cavanaugh et al. (2000) who had a sample of students classify 11 items from three separate stress measures (i.e., the *Job Demands and Worker Health Study*, Caplan, Cobb, French, Harrison, & Pinneau, 1975; the *Stress Diagnostic Survey*, Ivancevich & Matteson, 1983; and the *Job Stress Index*, Sandman, 1992) as either a challenge stressor or a hindrance stressor. Subsequent factor analyses were conducted on the participants' ratings of how stressful they thought each of the items to be. This factor analysis supported the two-factor structure (Cavanaugh et al.). The challenge stressor factor that emerged consisted of items reflecting time demands, workload, and responsibility. The second factor, hindrance stressors, included items measuring political barriers, role ambiguity, and role conflict. Having a sample of students rate stressor items as challenges or hindrances is no more in line with the transactional theory of stress than simply having researchers assess (appraise) the stressors, however. Instead, in order to test the theory, the challenge and hindrance appraisals of research participants themselves must be examined.

The few studies using Cavanaugh et al.'s categorization of stressors have found differential relationships between them and various outcomes, such that challenge stressors tended to be related favorably to non-strain outcomes such as job satisfaction (Podsakoff et al., 2007), loyalty (Boswell et al., 2004), performance (Pearsall et al., 2009), and retention (Podsakoff et al., 2007), whereas hindrance stressors related unfavorably to these outcomes. Although these studies have classified stressors *a priori*, assuming on average most people appraise stressors in the same way, it is implied that the underlying mechanism for the differential relationships between challenges and hindrances and work-related outcomes was employees' appraisals (LePine et al., 2005).

2. Transactional theory of stress

One well-known appraisal approach from the more general stress literature is the transactional theory of stress (Lazarus & Folkman, 1984), which argues that environmental conditions (stressors) are not the direct precipitating cause of a stress reaction, but rather it is the person's appraisal of challenge or hindrance (i.e., threat) that determines the response (Giancola et al., 2009, Storch et al., 2007). This theory places primary appraisal at the center of the stress process, and it is one of the main ways by which a person evaluates the meaning and significance of a situation. Situations perceived as having the potential for rewards (e.g., recognition and praise), mastery, and growth are referred to as *challenge appraisals*, whereas those that are perceived as having only the potential to threaten one's well-being by thwarting the attainment of goals and development are referred to as *hindrance appraisals* (Lazarus and Folkman, 1984, Skinner and Brewer, 2002).

The justification used for the challenge-hindrance occupational stress model's framework rests on the transactional theory of stress (e.g., Webster et al., 2010). However, research on the theory in workplace settings thus far has only assumed that the interpretation of a stressor as either a challenge or hindrance is the same for everyone and has not accounted for employees appraisals of them. It is also important to note challenge and hindrance appraisals are not necessarily mutually exclusive; thus, an individual can appraise a situation as being both a challenge and a hindrance simultaneously (Lazarus & Folkman, 1984). For instance, changing careers is a stressful event that has the potential for mastery and gains in professional development and financial rewards, but there is also potential for increased role complexity and unclear job demands. Based on this logic, when assessing one's appraisal of a situation it is important to measure the extent to which the situation is appraised both as a challenge and/or a hindrance. The assumption that all people make the same appraisal under the same circumstances and that appraisal can only lead to one of two distinctions (challenge *and/or* hindrance), are not consistent with the basic tenets of the appraisal theories of stress. Yet research up to this point on the challenge-hindrance model of occupational stress has operationalized challenge and hindrance stressors as the same for all employees. The present study takes the next logical step, testing the theory more directly by actually measuring each employee's challenge and hindrance appraisal of workplace stressors.

In addition to determining the extent to which an individual appraises a situation as being a challenge and a hindrance, the transactional theory of stress also argues that primary appraisal affects the type of outcomes a person will experience, such as his or her dissatisfaction with work. Although there has been an abundant amount of organizational research demonstrating the role of psychosocial and environmental stressors as determinants of strains and other outcomes, much less has actually examined appraisal, in particular primary appraisal, as the one of the key intervening mechanisms in the workplace stressor-strain relationship.

3. Hypotheses

In the present study we examined employees' appraisal of four workplace stressors role ambiguity, role conflict, workload, and responsibility for things. These were chosen because (1) they are commonly researched and are therefore well-established as important work stressors, and (2) the first two have been assumed to be hindrance stressors and the second two challenge stressors in previous research (e.g., Cavanaugh et al., 2000). As noted earlier, the transactional theory of stress argues that stressors can be appraised as both challenges and hindrances at the same time (although usually to different degrees) and also for different people to appraise them differently (Lazarus & Folkman, 1984). Therefore, the present study proposes that the stressors are positively related to both challenge and hindrance appraisals.

Hypothesis 1 (a–d)

a) Role ambiguity, b) role conflict, c) workload, and d) responsibility are positively related to challenge appraisal.

Hypothesis 2 (a–d)

a) Role ambiguity, b) role conflict, c) workload, and d) responsibility are positively related to hindrance appraisal.

Although each stressor can be appraised as both challenge and hindrance, previous research has assumed that two of these stressors are uniformly and exclusively appraised as challenges (i.e., workload and responsibility) and the other two as hindrances (i.e., role ambiguity and role conflict). The present study tests for the first time the appraisal assumptions made in previous research (e.g., LePine et al., 2005).

Hypothesis 3 (a–d)

a) Role ambiguity and b) role conflict are more strongly related to hindrance appraisals than to challenge appraisals, and c) workload and d) responsibility are more strongly related to challenge appraisals than to hindrance appraisals.

Challenge and hindrance appraisals are distinguished from one another by the types of immediate emotions they evoke, such that hindrance appraisals result in negative emotion (e.g., guilt and anger), while challenge appraisals results in pleasurable emotions (e.g., enthusiasm and joy; Lazarus & Folkman, 1984). From this perspective, stressors will only elicit a harmful strain response when appraised as a hindrance. Skinner and Brewer (2002) reported support for this prediction in an academic sample, finding that challenge appraisal was associated with positive emotions (e.g., excitement), whereas hindrance appraisals were shown to carry negative emotions (e.g., anxiety). Thus, challenge appraisal is hypothesized to be negatively related to strains while hindrance appraisal is posited to be positively related to strains. These predictions should be true no matter which stressor is being appraised as challenging or hindering, because it is the appraisal itself that is theoretically the cause of strains (Lazarus & Folkman, 1984).

Hypothesis 4(a–d)

Challenge appraisals for (a) role ambiguity, (b) role conflict, (c) workload, and (d) responsibility for things are negatively related to strains.

Hypothesis 5(a–d)

Hindrance appraisals for (a) role ambiguity, (b) role conflict, (c) workload, and (d) responsibility for things are positively related to strains.

Drawing again from the transactional theory of stress, it is proposed that challenge appraisals are likely to be associated with more favorable attitudinal and behavioral outcomes, given that this type of appraisal can foster employees' expectations of the potential for high accomplishment and goal attainment. Conversely, hindrance appraisal is likely to be associated with undesirable attitudinal and behavioral outcomes, because it is based on the potential for harm or failure (Skinner & Brewer, 2002).

Hypothesis 6(a–d)

Challenge appraisal for (a) role ambiguity, (b) role conflict, (c) workload, and (d) responsibility for things are positively related to job dissatisfaction and negatively related to turnover intentions.

Hypothesis 7(a–d)

Hindrance appraisal for (a) role ambiguity, (b) role conflict, (c) workload, and (d) responsibility for things are negatively related to job dissatisfaction and positively related to turnover intentions.

Beyond the direct-relationship hypotheses already stated, we also tested whether primary appraisal plays a mediating role between stressors and outcomes, as would be predicted by the transactional theory of stress. Studies have shown appraisal to be important in determining strains when encountering acute stressors such as taking a mental math test, albeit not in the context of the workplace (e.g., Wirtz et al., 2006, Wirtz et al., 2007). Recently, researchers were able to show that through an effective stress management training intervention, people's appraisals of a stressful situation could be influenced, which in turn, affected physiological stress responses (Storch et al., 2007). Those participants who received training showed a reduction in their level of hindrance appraisal, thus decreasing their cortisol levels. Finally, a study using a sample of employees showed that challenge appraisal partially mediated the relationship between a stressor (time pressure) and proactive work behaviors (Ohly & Fritz, 2010). Based on theory and these related empirical works, we made the following hypothesis.

Hypothesis 8(a–d)

Challenge and hindrance appraisal mediate the relationships between the stressors and the four outcome variables.

4. Method

The data were collected as part of a more general electronic survey of nonteaching employees of a large Midwestern university, sponsored by a human resources manager. Two reminder emails were later sent with a two-week time period between each.

In total, 1457 nonteaching employees were contacted, and 479 completed the survey (response rate of 33%). The majority were women (56.8%), and their average age was 45.0 years ($SD = 10.6$). Organizational tenure ranged from less than one to 43 years ($M = 10.4$; $SD = 9.2$). Ethnicities of respondents were African American (1.3%), Hispanic/Latino (0.6%), White (non-Hispanic; 76.0%), and other (1.7%).

4.1. Measures

4.1.1. *Role conflict*

Role conflict was measured with 3 items from Rizzo, House, and Lirtzman (1970). A 7-item version of the measure was shown to have good reliability ($\alpha = .80$) and was found to be related to frustration and anxiety, showing predictive validity (Spector, Chen, & O'Connell, 2000).

4.1.2. *Role ambiguity*

Role ambiguity was assessed using 3 items from Rizzo et al. (1970). Previous research reported a favorable reliability estimate for a 7-item version of the measure ($\alpha = .80$), and it was shown to be related to frustration, anxiety, job satisfaction, demonstrating predictive validity (Spector et al., 2000).

4.1.3. *Workload*

Workload was measured with Karasek's (1979) 4-item measure, modified to fit an agree–disagree response scale. Previous research using this measure reported good reliability ($\alpha = .77$) and found it to be related to depression and exhaustion (Karasek, Gardell, & Lindell, 1987), showing its predictive validity.

4.1.4. *Responsibility for things*

French and Caplan's (1970) 4-item scale was used to measure responsibility for things. Caplan, Cobb, and French (1975) reported an α of .66 and found the measure to be related to perceived workload.

4.1.5. *Primary appraisal*

Pearsall et al. (2009) successfully used single items as manipulation checks of challenge and hindrance by asking participants if they felt challenged or hindered in their experimental condition. These were essentially appraisal items. We followed a similar strategy to measure appraisals but used multiple appraisal items for each stressor. To be certain that respondents would interpret the terms challenge and hindrance in a manner consistent with the theory, definitions of both were provided to respondents (based on definitions in Cavanaugh et al., 2000). Challenge appraisal was defined as a challenging circumstance that although potentially stressful, is something you think you can overcome. These circumstances can help you meet your work goals and/or be motivating. Hindrance appraisal was defined as something that interferes with your work and can stand in the way of you being able to achieve your goals. These circumstances seem almost as a road block, impossible to overcome.

Participants were asked to respond to a challenge appraisal item and a hindrance appraisal item for each item of each stressor measure. Therefore participants made separate appraisals for each of the four work stressors, resulting in eight appraisal measures (four challenge appraisal measures and four hindrance appraisal measures). The response scales for each of the eight appraisal measures ranged from 1 “strongly disagree,” to 7 “strongly agree”.

4.1.6. *Emotional exhaustion*

Emotional exhaustion was assessed using the 9-item Maslach and Jackson (1981). Previous research using this measure reported a good reliability ($\alpha = .83$), and found it was related to depressive symptoms demonstrating convergent validity (Diestel & Schmidt, 2010).

4.1.7. *Physical symptoms*

Physical symptoms were assessed using an adaptation of Spector and Jex's (1998) 18-item measure, described in Webster et al. (2010), who reported a reliability estimate of .89 and provided validity evidence demonstrating its relationships with frustration, organizational citizenship behaviors, and job performance.

4.1.8. Job dissatisfaction

Job dissatisfaction was evaluated using Cammann, Fichman, Jenkins, and Klesh's (1983) 3-item measure. Items were reverse-scored to obtain a score of dissatisfaction. Spector, Dwyer, and Jex (1988) reported an alpha of .88, and found this measure to be related to anxiety, frustration, and intent to quit, demonstrating predictive validity.

4.1.9. Turnover intentions

Turnover intentions were assessed using a 3-item measure (O'Driscoll & Beehr, 1994). Previously reported reliability estimates have been good (alpha = .90) and it has been shown to be related to several facets of job satisfaction (Beehr et al., 2006).

4.2. Analyses

Four separate models were tested via structural equations modeling (SEM), one model for each stressor and its corresponding appraisals. Item parcels were created for the measures of emotional exhaustion and physical symptoms (Williams, Vandenberg, & Edwards, 2009). Three parcels were created for each construct by randomly assigning items into one of the three parcels. Data were then evaluated with a two-step procedure (Anderson & Gerbing, 1988) using LISREL 8.53 (Joreskog & Sorbom, 2002). This involved imposing constraints based on the hypothesized relationships among the latent constructs (see Figs. 1 and 2). Maximum likelihood estimation using the matrix of covariances was used to estimate the parameters.

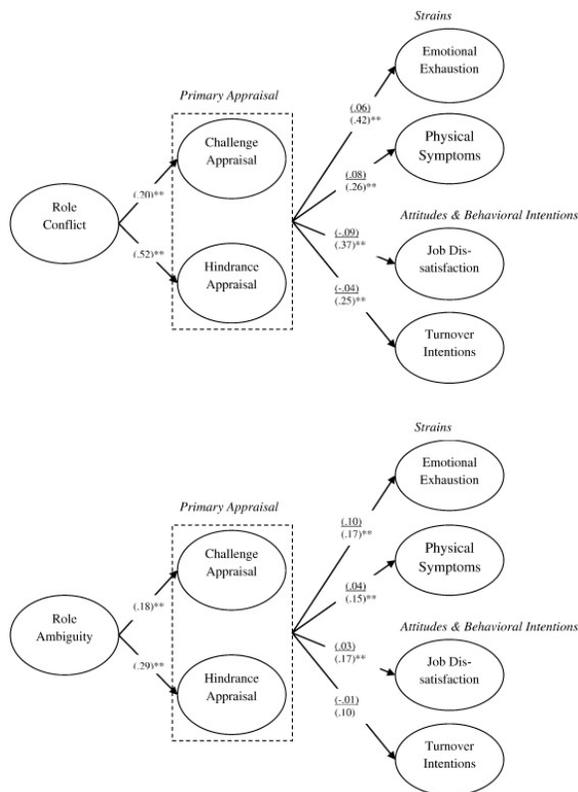


Fig. 1. Parameter estimates for the stressors previously labeled as hindrances. *p < .05. **p < .01.

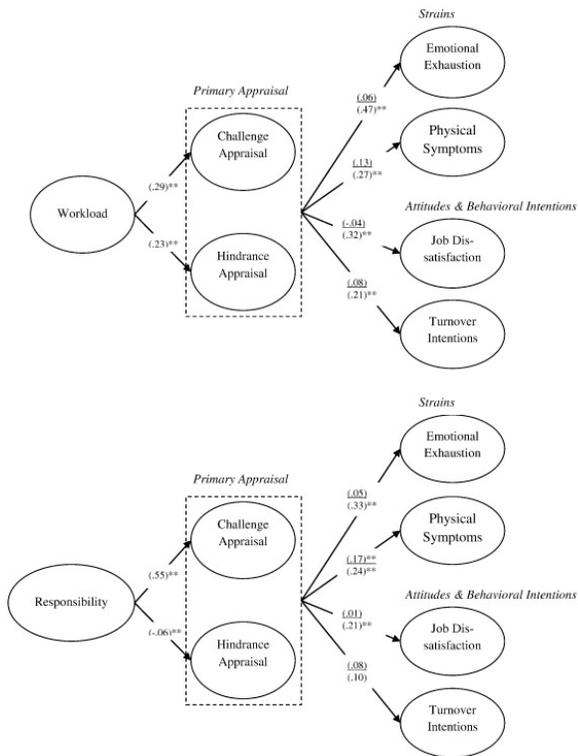


Fig. 2. Parameter estimates for the stressors previously labeled as challenges. * $p < .05$. ** $p < .01$.

5. Results

The coefficient alphas, means, standard deviations, and correlations among the study variables are in Table 1. For the first step of the two-step process, we evaluated the four measurement models. The fit statistics for the CFAs (see Table 2) show good fit for all four models. Item loadings across all four models were significant at the .01 level (their t-values were larger than 2.49), and ranged from .51 to .96.

Table 1. Means, standard deviations, reliabilities, and correlations among study variables.

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Role conflict	3.24	1.44	(.84)															
2. Chal app.	4.31	1.33	.18**	(.76)														
3. Hin app.	4.12	1.43	.38**	.15**	(.80)													
4. Role ambiguity	2.69	1.58	.68**	.07	.29**	(.93)												
5. Chal app.	4.00	1.61	.08	.53**	.57**	.17**	(.88)											
6. Hin app.	4.27	1.26	.19**	.19**	.57**	.27**	.25**	(.89)										
7. Workload	5.49	1.26	.21**	.15**	.17**	.09	.06	.08	(.89)									
8. Chal app.	5.46	1.24	.04	.40**	.16**	.02	.31**	.25**	.26**	(.91)								
9. Hin app.	3.16	1.40	.38**	.03	.40**	.30**	.05	.22**	.20**	-.08	(.91)							
10. Responsibility	4.63	1.46	.09	.14**	.13*	.01	.02	.07	.36**	.24**	.06	(.72)						
11. Chal app.	4.95	1.20	-.03	.30**	.22**	-.03	.25**	.28**	.12*	.59**	-.04	.42**	(.83)					
12. Hin app.	2.97	1.12	.21**	.03	.26**	.21**	.09	.15**	.08	-.03	.58**	-.03	-.09	(.84)				
13. Exhaustion	3.02	1.19	.57**	.09	.32**	.50**	.12*	.17**	.25**	.04	.41**	.08	.01	.28**	(.86)			
14. Phy symptoms	2.34	0.70	.28**	.10	.20**	.25**	.08	.13**	.12*	.10*	.23**	.06	.13*	.20**	.52**	(.86)		
15. Job dissatis	1.42	1.31	.53**	-.04	.25**	.59**	.05	.17**	.03	-.06	.30**	-.03	-.03	.21**	.69**	.32**	(.92)	
16. Turnover	2.71	1.76	.46**	.01	.19**	.45**	.03	.09	.10	.07	.22**	.07	.06	.11*	.53**	.23**	.69	(.90)

Note: *N* = 403; All measures were rated on 7-point Likert-type scales. Cha = Challenge; Hin = Hindrance; Exhaustion = Emotional exhaustion; Phy Symptoms = Physical symptoms; Job dissat = Job dissatisfaction; Turnover = Turnover intentions.

**p* < .05.

***p* < .01.

Table 2. Goodness of fit statistics for the measurements and structural models.

Model	$\chi^2(df)$	p	RMSEA	NNFI	CFI	$\Delta\chi^2(df)$
Measurement models						
Role conflict	432.43 (168)	.00	.06	.97	.97	
Role ambiguity	431.06 (168)	.00	.06	.97	.97	
Workload	850.67 (231)	.00	.08	.94	.95	
Responsibility	775.03 (231)	.00	.07	.93	.94	
Fully-mediated structural models						
Role conflict	562.95 (173)	.00	.07	.95	.96	
Role ambiguity	601.31 (173)	.00	.08	.95	.96	
Workload	919.62 (236)	.00	.08	.93	.94	
Responsibility	732.86 (236)	.00	.07	.93	.94	
Partially-mediated structural models						
Role conflict	419.03 (169)	.00	.06	.97	.97	143.92 (4)**
Role ambiguity	424.72 (169)	.00	.06	.97	.97	176.59 (4)**
Workload	898.63 (232)	.00	.08	.94	.95	20.99 (4)**
Responsibility	732.56 (232)	.00	.07	.93	.93	9.30 (4)*

Note: N = 403. df = degrees of freedom; RMSEA = root-mean-square error approximation; NNFI-non-normed fit index; CFI = comparative fit index. The chi-square difference test compares each partially mediated model with the corresponding fully mediated models.

* $p < .05$.

** $p < .01$.

The second step in the process was to evaluate the structural models. The fit statistics (see Table 2) suggest good fit for all four models. The RMSEA indices for the four models all indicated a good fit, with values less than or equal to .08. CFI and NNFI values also indicated good fit for all four models; they were all greater than or equal to .90. Overall, the models proposing that primary appraisal of work-related stressors as challenge or hindrance is a key variable in the relationships between stressors and outcomes such as psychological and physical strains, attitudes, and behavioral intentions were supported.

5.1. Direct relationship hypotheses

Fig. 1, Fig. 2 provide the standardized parameter coefficients for the proposed model for each stressor and its corresponding appraisal. The statistically significant parameter estimates between each stressor and its challenge appraisal measure (role conflict, $\beta = .20$; role ambiguity, $\beta = .18$; workload, $\beta = .29$; and responsibility, $\beta = .55$; $p < .01$) indicate support for Hypothesis 1. Statistically significant parameter estimates were also found between three stressors and their corresponding hindrance appraisal measures (role conflict, $\beta = .52$; role ambiguity, $\beta = .29$; and workload, $\beta = .23$; $p < .01$), but the path between responsibility and its hindrance appraisal measure was not significant. Therefore, support was provided for Hypotheses 2a, 2b, and 2c, but not for 2d.

Hypothesis 3, based on the assumptions of past research, proposed that role conflict and role ambiguity would be more strongly appraised as hindrances than challenges, and that workload and responsibility would be more strongly appraised as challenges than hindrances. Results show that the differences between correlations in all four instances were in the predicted direction, and two of the four were significantly different by the Williams T2 statistic (Steiger, 1980). As hypothesized, role conflict had a significantly stronger correlation with hindrance appraisal than with challenge appraisal ($t = 3.29$, $p < .01$), supporting Hypothesis 3a. In support of Hypothesis 3d, responsibility had a much stronger correlation with its respective challenge appraisal than with its hindrance appraisal ($t = 6.62$, $p < .01$). The differences between correlations of role ambiguity and workload stressors with

their challenge and hindrance appraisals were not significant however, and thus Hypotheses 3b and 3c were not supported. Therefore, partial support was found for Hypothesis 3.

Hypothesis 4, which proposed negative relationships between each stressor's challenge appraisal measure and both strains (emotional exhaustion and physical symptoms) was not supported. It is important to note, however, that there were significant *positive*, rather than negative, relationships of the challenge appraisals of workload ($\beta = .13, p < .05$) and responsibility ($\beta = .17, p < .01$) with one strain, physical symptoms. Appraising these two stressors as challenges may lead to the person experiencing more rather than less strain in the form of physical symptoms.

Results supported Hypothesis 5, as there were significant parameter estimates for the relationships of each stressor's hindrance appraisal, role conflict (5a), role ambiguity (5b), workload (5c), and responsibility (5d), with both emotional exhaustion ($\beta = .42, .17, .47, \text{ and } .33$ respectively; $p < .01$), and physical symptoms ($\beta = .26, .15, .27, \text{ and } .24$ respectively; $p < .01$). Thus, results fully supported Hypotheses 5a through 5d, suggesting that appraising stressors as a hindrance may be harmful for employee health and well-being.

Hypotheses 6a through 6d proposed that people who appraise a stressor as a challenge would experience less job dissatisfaction (essentially more satisfaction) and would be less likely to turnover. No significant relations were found; thus Hypothesis 6 was not supported. Results for Hypothesis 7 showed that each stressor's hindrance appraisal (role conflict, role ambiguity, workload, and responsibility) was positively related to job dissatisfaction ($\beta = .37, .17, .32, \text{ and } .21$ respectively, $p < .01$), but only two stressor's hindrance appraisals were related to turnover intentions (role conflict, $\beta = .25$, and workload, $\beta = .21, p < .01$). Overall, these results generally supported the proposition that appraising the situation as hindering has a negative impact on work-related outcomes, but appraising a situation as a challenge had little influence on outcomes.

5.2. Mediation hypothesis

Hypothesis 8 posited that primary appraisal mediates the relationship between stressors and outcomes. All four models included this mediation, and were all supported (see Table 2). Partially mediated models were also examined that included both direct and indirect effects between stressors and outcomes, in order to test further whether primary appraisal fully mediated the stressor-outcome relationship. Each partially mediated model added four paths to the figure: paths from the model's stressor to each of the four outcomes. Fit indices for the partially mediated models (shown in Table 2) indicated a good fit between the models and the data. Chi-square difference tests were calculated comparing the chi-square statistics for the fully mediated models with the chi-squares for the partially mediated models. The results indicated that the fit for the partially mediated models were significantly better than the fit for the fully mediated models (role conflict, $\Delta\chi^2[169] = 143.92, p < .01$; role ambiguity, $\Delta\chi^2[169] = 176.59, p < .01$, workload, $\Delta\chi^2[232] = 20.99, p < .01$, responsibility, $\Delta\chi^2[232] = 9.30, p < .05$). Therefore, regarding Hypothesis 8, partial mediation was supported. The total percentage of variance accounted for by the direct and indirect effects across the four dependent variables for the model including role conflict ranged from 10 to 51, for the model including role ambiguity ranged from 8 to 41, for the model including workload ranged from 5 to 24, and for the model including responsibility ranged from 2 to 12.

6. Discussion

The purpose of the present study was to gain a better understanding of one of the theoretical foundations underlying the challenge-hindrance occupational stress model, the transactional theory of stress (Lazarus & Folkman, 1984). We tested the assumption that certain stressors are appraised as either challenges or hindrances, and we tested whether primary appraisal mediates the relationships of the stressors with strains and other outcomes. Overall, the results supported the basic tenets of the transactional theory of stress:

although a stressor could be primarily seen as a challenge or hindrance, it could also be simultaneously perceived as being both challenge and hindrance to varying degrees and primary appraisal partially mediated the stressor-outcome relationship.

6.1. Primary appraisals of stressors as challenges and/or hindrances

The first two hypotheses focused on whether stressors could be simultaneously appraised as both a challenge and hindrance, as would be expected by the transactional theory of stress. The results largely supported this predication with the exception of responsibility, which tended to be seen only as a challenge. This suggests that previous studies (mainly meta-analyses; LePine et al., 2005, Podsakoff et al., 2007) were only partially correct in classifying stressors as one or the other. Furthermore, only two of the four stressors had challenge and hindrance appraisal correlations that were significantly different (i.e., role conflict and responsibility). Although we must be careful about interpreting null results, the failure to find support for all four hypotheses suggest that classifying these stressors as either challenge or hindrance may be overly simplistic, because workers tended to appraise the stressors as both.

6.2. Relationships between appraisals and outcomes

With regard to Hypotheses 4 and 5, it was predicted that the hindrance appraisal of each stressor would be positively related to strains, whereas challenge appraisals would be negatively (favorably) related. Hindrance appraisals were positively related to both psychological and physical strains, consistent with the themes of both the challenge-hindrance occupational stress model and the transactional theory of stress. As for challenge appraisals, however, negative relations were not found with strains. Instead, two of the challenge appraisals (for the stressors workload and responsibility) actually had positive relationships with physical symptoms, a physical strain. This suggests that although challenge appraisals may not elicit strong positive or negative emotions (psychological strain), they may still have a negative impact on physical health. Thus, employees who report having a heavy workload or a great deal of responsibility may not experience psychological effects, but they may experience aversive physical ailments such as headaches or sleep disturbances. This result is not entirely consistent with the transactional theory of stress, and it suggests that stressors appraised both as hindrances and as challenges can have aversive effects on employees. It is consistent, however, with the definition of stressors, i.e., working conditions and events that can adversely affect employees' strains (e.g., Jex and Yankelevich, 2008, Semmer et al., 2005). Therefore, the concept of "challenge stressors" is consistent with the idea that such working conditions can be harmful for the individual even if they are appraised as challenges.

Hypotheses 6 and 7 focused on the relationships between appraisals and job dissatisfaction and turnover intentions. Each stressor's challenge appraisal had small and nonsignificant relations with job dissatisfaction and turnover intentions. Therefore, the refinement of the challenge-hindrance occupational stress model does not seem to support some implications from previous research that did not measure appraisals (summarized in meta-analyses; e.g., Cavanaugh et al., 2000, LePine et al., 2005). Actual challenge appraisals were not significantly related to work outcomes (dissatisfaction and turnover intentions), nor to psychological strain. Compared to challenge appraisals, hindrance appraisals were more consistently related to unfavorable work outcomes. Across the four models, employees who appraised the stressors as hindrances reported more job dissatisfaction, but only two of the four hindrance appraisals (hindrance appraisals of role conflict and workload) were related to turnover intentions. Overall, however, these results suggest that hindrance appraisals are typically met with aversive health- and work-related outcomes.

6.3. Primary appraisal as a mediator

Primary appraisal is predicted to be one of the main mechanisms linking stressors to outcomes (transactional stress theory; Lazarus & Folkman, 1984). The present study supported a partially mediated model in which stressors related to outcomes both directly and indirectly through appraisal. One explanation is that the present

study focused solely on *primary* appraisal as a mediator, and according to Lazarus (1966) transactional theory of stress, there is also a secondary appraisal, the evaluation of one's coping capabilities for dealing with a situation. It may be that both forms of appraisal together would have fully mediated the relationships between stressors and strains. The second explanation is simply that stressors may directly impact the stress response. When Lazarus (1966) introduced the transactional model of stress, his primary focus was on coping. He described coping as an intentional reaction to stressors that involves effort. In order for coping to be intentional, however, a person must appraise a situation as being stressful (Beehr & Franz, 1986). That is, if there is no threat in the situation, there is no reason to intend to cope and initiate coping activities. However, the results of the present study's mediation analyses suggest that stressors may be harmful to people even if the stressor is not appraised as being stressful. Thus, it may be that appraisal is necessary to cope but not necessary to feel the effects of stress. This is consistent with research conducted on physical stressors such as noise, dirt, heat, or toxic substances (Seeber and Iregren, 1992, Selye, 1956), which are harmful regardless of whether or not the person is cognitively aware of them. Thus physical stressors may lead to outcomes without appraisal, and social stressors may be able to act in a similar way.

6.4. Theoretical contributions

The present study extends the research on the challenge-hindrane model by integrating a basic tenet of transactional stress theory. The few studies of challenge and hindrance stressors in the work domain have classified stressors *a priori*, assuming that on average most people cognitively appraise each environmental stressor in the same way. This approach is consistent with the probabilistic stressor concept from the epidemiological risk factor model (Cohen, Kessler, & Gordon, 1997), which does not claim everyone will respond to a stressor in the same way but rather, on average, the majority of individuals will have similar stressor responses (Kahn & Byosiere, 1992; Semmer, 2003). However, the transactional theory of stress suggests that stressors can be appraised as both challenges and hindrances simultaneously, and such primary appraisal acts as a main mechanism linking stressors to outcomes. The positive relationship found for the challenge appraisals of workload and responsibility with physical symptoms are consistent with the Effort–Recovery (E–R) model (Meijman & Mulder, 1998) of stress that suggests experiencing high job demands (e.g., work overload and responsibility) requires effort that is unavoidably associated with strain (e.g., accelerated heart rate or acute fatigue). Even if people do not experience psychological strain, it is likely that stressors such as workload and responsibility cause people to work harder and longer, which may impact their physical health. Based on the E–R model, these strains are likely to cease once exposure to these high demand situations disappears (i.e., recovery; Ragsdale et al., 2011). However, if these situations persist, people will continue to experience negative reactions such as sustained fatigue. Thus, although appraised as a challenge, and having no apparent link to psychological strain, these stressors may still be damaging to employee health over the long run.

6.5. Future directions and limitations

The results of this study suggest several avenues for future research. First, among methodological limitations, common method variance could be reduced by using multiple sources to measure stressors and strains (e.g., Podsakoff, MacKenzie, Podsakoff, & Lee 2003). For instance, supervisors or coworkers could provide information as to the presence and/or amount of stressors present on the job. Organizational records, physician's records, or the reports of family members could be used to measure certain strains. Only the appraisals would need to come from the focal person, because it is the appraisal by individuals themselves that translates the objective environment into their own subjective environment (Lazarus & Folkman, 1984). It should be noted, however, that the models and some of the findings (e.g., differential relationships of variables with primary appraisals and mediation) cannot be explained by the typical problems associated with common methods.

Second, although the hypotheses were derived from strong, well-established theory, the inference of causality allowed by the data collection method is limited. To fully understand this process, future research could use longitudinal and at least quasi-experimental designs. Doing so will not only enhance casual inferences (see Rindfleisch, Malter, Ganesan, & Moorman, 2008) but also provide a better understanding of the possible long term implications of stress.

A more substantive suggestion is that researchers should investigate secondary as well as primary appraisal of workplace stressors. The variance left over or unexplained in the present study might be explained by secondary appraisal. Furthermore, the issue of time and past experience suggests employees learn not only how to cope but also how to appraise. Thus, learning based on past experience may determine primary (and secondary) appraisals. In closing, the present study demonstrated that a potential stressor is not appraised in only one way; the same stressor can be appraised as both a challenge and a hindrance. Primary appraisals can lead to strains and other outcomes, even though the stressors themselves might have independent effects. By understanding differences in appraisals, employers and practitioners can tailor stress interventions based on individual employee cognitions. This would render prevention and intervention programs more effective for both the employee and employer.

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