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POINT-COUNTERPOINT

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Should we be "challenging" employees?: A critical review and meta-analysis of the challenge-hindrance model of stress

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Summary

The challenge-hindrance model of stress proposes that stressors can be divided into two distinct groups: those that challenge employees and those that hinder employees. This critical review seeks to explain the history of the model and its basic tenets, while succinctly summarizing the findings of existing studies based on the model. A thorough search of the stress literature uncovered 32 studies that specifically examined the relationship between challenge and hindrance stressors and important personal/organizational variables. Results were reviewed and analyzed, specifically by describing past meta-analyses on the model, looking at the overall pattern of results from primary studies, and meta-analyzing the relationships presented in those papers. This synthesis suggests that although there are some differential relationships of challenge and hindrance stressors with organizational variables (e.g., performance and engagement), the relationships to other key variables, such as counterproductive work behaviors, psychological strains, and physical health, are consistently negative for both challenge and hindrance stressors. Thus, we propose that stress research move away from the current challenge-hindrance model in favor of other established models and/or a more appraisal-based approach.

KEYWORDS

burnout, challenge, hindrance, strain, stress

1 | INTRODUCTION

The transactional model of occupational stress (Lazarus & Folkman, 1984), likely the most prevalent model used in stress research, suggests that stress occurs when employees perceive a stimulus as threatening, and that this stress response has a direct positive relationship to detrimental physical and psychological outcomes (i.e., strains). However, the evolutionary purpose of stress posits that stress has beneficial qualities that aided our ancestors in survival (Selye, 1976); thus, some researchers have sought to better understand the duality of stress and have attempted to capture its positive components (e.g., Cahill, Gorski, & Le, 2003; Dienstbier, 1989; Duncko, Johnson, Merikangas, & Grillon, 2009).

In an effort to identify and explain how relationships between stress and desirable outcomes could be utilized in the workplace, Cavanaugh, Boswell, Roehling, and Boudreau (2000) proposed the challenge-hindrance stress model (CHM). The CHM states that workplace stressors should be split into two distinct categories. The first category, hindrance stressors (HS), are demands that are likely to interfere with or thwart performance and personal goals. These stressors align with the more traditional conceptualization of stress and stressors as negative and strain-inducing (e.g., Nixon, Mazzola, Bauer, Krueger, & Spector, 2011). The second category, challenge stressors (CS), are demands that create opportunities for performance and a sense of accomplishment (Webster, Beehr, & Love, 2011), which Cavanaugh et al. (2000) posited would relate differently and likely positively to relevant outcomes in comparison to HS (specifically job satisfaction and job search in their initial examination). They felt these two distinct categories had differing effects on individuals and could better account for the inconsistent and weaker than expected relationships found in past stress literature.

Over the last decade and a half, this model has gained favor with many stress researchers, and research attempting to expand it has grown considerably. The reason behind this boon likely results from the model's succinct, simple design, and some initial support for its tenets (e.g., Cavanaugh et al., 2000; LePine, Podsakoff, & LePine, 2005). Furthermore, as research on the model has continued to expand (e.g., Edwards, Franco-Watkins, Cullen, Howell, & Acuff, 2014; Rodell & Judge, 2009; Webster et al., 2011), a broader array of outcomes have been included, such as physical symptoms (e.g., Webster et al., 2011), performance (e.g., Pearsall, Ellis, & Stein, 2009), job attitudes (e.g., Webster et al., 2011), and safety behavior (e.g., Clarke, 2012). Supporters of the model have encouraged its adoption, stating, for example, "research and practice would benefit by distinguishing among challenge and hindrance stressors" (LePine et al., 2005, p. 764), and by researchers even presenting CHM as *the* prominent stress model, as evidenced by quotes such as "in the literature, job stressors are differentiated into challenge stressors and hindrance stressors" (Prem, Ohly, Kubicek, & Korunka, in press, p. 3).

However, the adoption and general embrace of this model may be, in our opinion, premature. To our knowledge, no existing meta-analysis or review has been published that depicts a consistent pattern of results in precise alignment with the model. Indeed, as will be discussed in the remainder of this review, although some studies have had success in finding *some* differential relationships for CS versus HS with outcome variables (e.g., LePine et al., 2005; Liu, Liu, Mills, & Fan, 2013), almost none have found full support for its tenets. Indeed, still more studies have found little to no significant differences between CS and HS (Boswell, Olson-Buchanan, & LePine, 2004; Jones, 2012; Moise, 2014; Rodell & Judge, 2009; Webster, Beehr, & Christiansen, 2010). This should lead the field to at least wonder, does this theory present an incorrect or flawed model of how stress impacts individuals? If this is the case, we, as stress researchers, could be heading down a dangerous path by continuing to expend time and energy on extending a concept that is not grounded in empirical evidence. Further, if CS still lead to strain (despite other potential "positive" effects proposed), but practical suggestions are made to increase CS or simply ignore them in stress management programs, the outcome may be more than just detrimental effects to employees in those organizations. This could ultimately lead to distrust of the suggestions made by stress researchers as a whole, much in the same way a poorly tested and harmful drug treatment reflects poorly on the medical industry.

Thus, the goal of this review is to provide the first "big picture" evaluation of CHM based on studies that have specifically tested the model. Enough research has now been done since the seminal paper by Cavanaugh et al. (2000) that it is time to examine what exactly we do and do not know about the nature of "challenge" and "hindrance" stressors and allow empirical findings to inform the way we utilize the model going forward. To this end, we will evaluate how well the evidence fits the proposed model through three methods: (a) critical evaluation of the CHM "meta-analyses" previously conducted using samples of studies which included stressors typically categorized as CS or HS but which were not empirically testing the CHM at the time originally collected, (b) a meta-analysis conducted for this review using those empirical studies designed to evaluate the CHM, and (c) an explanation of the pattern of results from all of the studies that have directly and empirically tested the CHM. Although previous researchers have noted potential issues with the CHM (e.g., Edwards et al., 2014; Tuckey, Searle, Boyd, Winefield, & Winefield, 2015; Webster et al., 2010), we believe this paper is the first to thoroughly compare the entirety of the CHM research side-by-side in a manner allowing for a better understanding of the model's overall functionality, including a quantitative combination of those findings.

2 | ORIGIN OF THE CHM

Cavanaugh et al. (2000) published the paper that first put a name and empirical test to the CHM. The catalyst partially came from some studies on work stress failing to find significant correlations to job search and job satisfaction (Bretz, Boudreau, & Judge, 1994; Leong, Furnham, & Cooper, 1996), despite the expectation that a negative relationship would be shown based on most existing stress theories (e.g., Lazarus & Folkman, 1984). Having noticed these inconsistent patterns in stressor-outcome relationships in existing stress literature, Cavanaugh et al. decided to break stressors into two distinct categories they felt conveyed different meanings to the employee and would, theoretically, result in differing relationships to outcomes. Workload, time demands, and responsibility were considered CS, whereas political barriers, role ambiguity, and role conflict were labeled as HS (Cavanaugh et al., 2000). They found that CS and HS were only moderately correlated to each other (r = .28) and produced differential relationships to their outcomes (job satisfaction r = −.03 and −.52; turnover r = .01 and.21, respectively), suggesting discriminant validity between the two constructs and supporting their hypotheses that stress could be divided into two distinct groups with differing outcomes.

However, Cavanaugh et al.'s (2000) study contained potential methodological issues that raise questions about its generalizability and might have contributed to the subsequent failures to replicate the results. First, the sample studied by Cavanaugh et al. was particularly specialized and unusual. Specifically, it consisted of U.S. managers who had received an average of 7.9 promotions in their career, worked 56 hr per week, and were generally only two levels below the CEO in their companies. Based on these characteristics, this sample most appropriately represents a population of high-level leaders, rather than the "average" employee. Research has shown that leadership (and leader emergence) is related to specific personality variables (e.g., conscientiousness and extraversion; Judge, Bono, Ilies, & Gerhardt, 2002), which brings into question the notion that the findings from this study generalize beyond high-level managers, who may be more likely to thrive on what Cavanaugh et al. identify as CS (i.e., high workloads and frequent interpersonal interaction). The likelihood of generalizability is further questioned based on their finding that women experienced lower levels of challenge-stressors, suggesting that even the exposure to stressor types (or appraisal of stressors as CS or HS) may not be consistent across diverse samples.

Second, there is a potential flaw in Cavanaugh et al.'s assertion that all people make the same appraisal of stressors across varying situations, as it is not consistent with Lazarus and Folkman's (1984) transactional model and/or appraisal theories of stress (a criticism originally presented by Webster et al., 2011, as well as Searle & Auton, 2015). Rather, it is much more likely that individuals appraise stressors differently, based on any number of internal and external variables. The CHM as currently constructed fails to account for this appraisal process. Webster et al. (2011) noted that, for most challenge-hindrance studies, an a priori assumption is simply made that certain stressors (as defined in the original model) are specifically challenging, whereas others are hindering. They tested this assumption and found that "workload, role ambiguity, and role conflict could be appraised primarily as challenges *or* hindrances (p. 505)" but could also be perceived as both at the same time. In fact, when participants were asked to rate their appraisals of the stressor on one-item measures of how much they challenged/hindered them, the correlations to challenge and hindrance were very similar for both workload (challenge.29; hindrance .23) and role ambiguity (.18 and.29, respectively).

3 | PREVIOUS CHM META-ANALYSES

The oversight of not considering different appraisals of stressors was potentially exacerbated by the design of the first studies that followed the original work by Cavanaugh et al. (2000). Two of the earliest studies attempting to extend the CHM (LePine et al., 2005; Podsakoff, LePine, & LePine, 2007) were meta-analyses sampling previous studies which had measured the stressor variables Cavanaugh et al. (2000) had categorized as CS and HS. To be clear, the original studies utilized in these meta-analyses were not testing the CHM. Rather, they were testing other stress concepts, and the authors of the meta-analyses divided the measured stress variables into the CS and HS dichotomy for their meta-analyses. In general, this is a perfectly valid and clever way to study a new model, but given the inconsistency in appraisal of stressors as challenges or hindrances, this methodology may not have been ideal until further research had determined if and how these stressors are actually perceived at the individual-level.

The first study to do this was LePine et al. (2005). Their variables included task performance, motivation, and strains (here, a combination of psychological and physical). They found differential relationships for task performance between the estimated true correlations corrected for sampling error, r_c = .12 for CS and −.20 for HS with no overlap between confidence intervals. Whereas for motivation, they found a similar difference (r_c = .16 versus −.12), but the confidence intervals did overlap suggesting the difference was potentially due to sampling error. However, they found strong and positive relationships for both stressor types with strains (CS = .40, HS = .58), showing the negative effects that all stressors can have on physical and mental health.

Podsakoff et al. (2007) conducted a similar meta-analysis that included slightly different variables. They found partial support for the model as job satisfaction (r_c = −.52) and organizational commitment (r_c = −.52) were significantly and negatively related to HS while there were nonsignificant relationships to CS (r_c = −.02 and r_c = .04, respectively). These findings in particular will fall in line with our later meta-analytic results for job satisfaction. Similar differences existed for HS and CS to turnover intentions (.36 to .09) and turnover (.04 to .23), but once again, general strain related strongly for both types of stressors (.40 to.56). It is important to note that although some of the relationships in these studies are different for HS and CS to some outcomes, none of them indicate "positive" effects of CS.

4 | CURRENT META-ANALYSIS

A thorough search of the relevant research databases was conducted in the fall of 2018 to find articles that have tested tenets of the challenge-hindrance model. EBSCOhost search engine was used to search the databases of Academic Search Premier, Business Premier, Business Source Complete, Dissertation Abstracts, MEDLINE, PSYCArticles, and PSYCInfo using the search terms "challenge hindrance," "challenge/hindrance," "challenge stress," "hindrance stress," "challenge stressors," "hindrance stressors," "Cavanaugh," and "Cavanaugh et al." We also emailed relevant listservs to search for unpublished studies that examined the model, searched the conference programs from the SIOP and Work, Stress, and Health conferences from 2011 to 2018, and explored the references cited in the more recent tests of the model for previous papers that examined some portion of the model/constructs.

Only articles published after the year 2000 (when the original Cavanaugh et al. article was published) were reviewed and synthesized for this paper. The search resulted in identifying 72 articles and unpublished manuscripts that appeared to measure or report on the CHM in some way. To meet our criteria for inclusion in the meta-analysis, studies had to measure both CS and HS as a specific test of the CHM, be a primary study, and had to report correlations or statistics that could be converted into correlations for both CS and HS to an outcome variable. After closer examination, 26 of the original 72 articles were relevant to this literature review and met our inclusion criteria, resulting in 28 samples and 156 unique correlations that were included in the meta-analysis. All articles included in the review can be found in the Appendix A.

We meta-analyzed our data using the widely popular, bare-bones approach by Hunter and Schmidt (1990) through the programming software R. Because our goal was to find and examine the overall trends for the model on various outcomes, no corrections or additional moderators were conducted. It should also be noted that some of the outcomes used in the same analysis differed slightly (e.g., organizational citizenship behaviors [OCB] included all variables under that umbrella term such as OCB-individual and OCB-organization), and all challenge and hindrance stressors were grouped together in analyses based on how the original authors used them to test the model. Additionally, some studies used either multiple HS/CS or more than one measure for a dependent variable, resulting in multiple correlations

for the same relationship from the same sample (eight studies), so the data are not completely independent. However, some nonindependence is not overly problematic in meta analyses (Tracz, Elmore, & Pohlmann, 1992).

5 | SUMMARY AND SYNTHESIS OF CHALLENGE-HINDRANCE RESEARCH

Tables 1–4 present the individual correlations from the studies that tested direct relationships between CS–HS and various organizational and personal outcomes where at least three studies were available for the outcome, as well as the meta-analysis results. For the individual studies, the correlations are provided with an indication of the significance level reported by the original authors of those studies. Even though these studies were all included in the meta-analytic results, because the CHM model predictions rely on differential relationships, we felt it was important to also briefly mention how many of the individual studies found support for the CHM in their studies, because the comparisons of corresponding relationships of CS and HS to outcomes in that specific sample are important pieces of that puzzle.

For the purpose of this review, all findings are being compared with the original model. A result is considered to fully support the CHM if the CS has a significant positive relationship to desirable outcome variables, or a significant negative relationship to undesirable outcome variables, whereas the HS has a significant opposite

TABLE 1 Relationship between challenge/hindrance stressors and performance, OCBs, CWBs

Study	Correlations					
	Performance		OCBs		CWBs	
	CS	HS	CS	HS	CS	HS
8.					***.18***	***.24***[f] ***.34***[g]
9.			.04	−.07	***.31***	***.41***
11[a].	***.21***	***−.27***				
12.	.08	***−.17***				
13.	−.04	***−.18***	*.09*	*−.09*		
18.			*.35*	*.17*	-.03	*.21*
20[a].	−.04	***−.25***				
26.	*.16*	*−.26*	.07	*−.41*		
27.	−.06	−.06	.12[d] .08[e]	.04[d] −.13[e]		
29[a].	.11	−.10				
31.	*−.19*	*−.37*	*−.14*[b] *−.23*[c]	*−.44*[b] *−.27*[c]	*.31*	*.54*
Meta-analytic results						
k	5	5	8	8	4	4
N	1,431	1,434	2,140	2,140	1,413	1,752
$\bar{r}$	−.03	−.22	.01	−.18	.23	.32
σ_ρ	.10	.08	.13	.16	.08	.11
95% CI	−.14, .08	−.31, −.14	−.10, .12	−.32, −.05	.13, .33	.21, .44

Note: Study numbers refer to studies listed in Appendix A. Multiple correlations are listed within the same study and CS/HS column when the study utilized multiple variables to measure the stressor or outcome and the strength of the relationships differed between variables. Correlations in italics are significant at .05. Bold and italics are significant at .01.

Abbreviations: CS, challenge stressors; HS, hindrance stressors.

[a]Study not included in meta-analysis

[b]Helping behavior as the OCB.

[c]Voice behavior as the OCB

[d]OCB-I as the OCB.

[e]OCB-O as the OCB.

[f]Role ambiguity as HS.

[g]Role conflict as HS.

TABLE 2 Relationship between challenge/hindrance stressors and job attitudes

Study	Correlations							
	Job satisfaction		Intent to quit		Job search		Turnover	
	CS	HS	CS	HS	CS	HS	CS	HS
1.			.05	***.38***	.05	***.40***		
2.	−.03	***−.52***			-.03	***.35***	.01	***.21***
8.	***.21***	***−.57***[b] ***−.21***[c]						
10.	.03	***−.26***						
15.	−.04[e] −.01[f]	***−.27***[c] ***−.42***[d]	.02[e] .04[f]	***.29***[c] ***.27***[d]				
17[a].	.02	*−.57*	*.11*	*.49*			.04	*.23*
27.	.12	***−.39***						
28.	−.03[f] .03[e]	***−.53***[c] ***−.59***[b]					.10[f] .07[e]	***.46***[c] ***.45***[b]
Meta-analytic results								
k	8	9	3	3	2	2	3	3
N	4,344	4,944	633	633	2,340	2,340	1,671	1,671
$\bar{r}$	.02	-.46	.04	.35	−.01	.36	.05	.35
σ_ρ	.07	.13	.00	.00	.01	.00	.00	.12
95% CI	−.05, .10	−.57, −.34	−.03, .12	.28, .42	−.06, .03	.32, .40	.01, .10	.21, .49

Note: Study numbers refer to studies listed in Appendix A. Multiple correlations are listed within the same study and CS/HS column when the study utilized multiple variables to measure the stressor or outcome and the strength of the relationships differed between variables. Correlations in italics are significant to.05. Bold and italics are significant at .01.

Abbreviations: CS, challenge stressors; HS, hindrance stressors;

[a]Study not included in meta-analysis.

[b]Role ambiguity.

[c]Role conflict.

[d]Interpersonal conflict.

[e]Job responsibility.

[f]Workload.

TABLE 3 Relationship between challenge/hindrance stressors and strains/other outcomes (excluding burnout)

Study	Correlations							
	Psychological strain		Physical strain		Engagement		Positive affect	
	CS	HS	CS	HS	CS	HS	CS	HS
1.	***.34***	***.37***						
4.	***.31***	***.45***						
6.	***.46***[f] ***.39***[e]	***.36***[k] ***.47***[h] ***.50***[l]	***.22***[f] *.20*[e]	.10[k] ***.24***[h] ***.28***[l]				
11[a].	***.23***	***.50***						
12.	.12	***.25***						
14.					*−.14*	*−.13*		
17[a].	*.56*	*.40*	*.56*	*.40*				
18.	*.23*[b] *.18*[c]	*.25*[b] *.36*[c]						
19.	***.19***	***.41***					***.02***	−.08
20[a].	***.17***	***.43***					*.13*	***−.16***
21.					***.43***	.09		
22.					*.12*	***−.25***	***.15***	***−.19***
23.	*.22*[e]	*.38*[h] *.16*[i]						
27.	***.42***	***.48***	***.21***	***.26***				
28.			***.12***[h] .06[i]	***.28***[h] ***.25***[i]				
30[a].	−.05[b]	***−.47***[b]						
	.04[g]	***−.25***[g]						
Meta-analytic results								
k	10	12	5	6	3	3	2	2
N	2,880	3,717	1,557	1,785	537	537	582	582
$\bar{r}$	.29	.36	.14	.24	.09	−.11	.10	−.15
σ_ρ	.08	.10	.03	.01	.22	.11	.03	.00
95% CI	.22, .35	.29, .43	.08, .19	.20, .29	−.18, .36	−.25, .04	.01, .19	−.23, −.07

Note: Study numbers refer to studies listed in Appendix A. Multiple correlations are listed within the same study and CS/HS column when the study utilized multiple variables to measure the stressor or outcome and the strength of the relationships differed between variables. Correlations in italics are significant at .05. Bold and italics are significant at .01.

Abbreviations: CS, challenge stressors; HS, hindrance stressors.

[a]Study not included in meta-analysis.

[b]Anxiety as strain.

[c]Anger as strain.

[d]Psychological strains measured as combination of many types.

[e]Workload.

[f]Job demands.

[g]Depression.

[h]Role conflict.

[i]Role ambiguity.

[j]Responsibility.

[k]Interpersonal conflict.

[l]Organizational politics.

relationship to that outcome variable within the same study or analysis. Partial support will be shown in studies where one type of stressor relates in the expected direction, whereas the other relationship is nonsignificant and/or near zero, and a study that shows both variables

TABLE 4 Relationship between challenge/hindrance stressors and burnout

Study	Correlations	
	Burnout	
	CS	HS
1.	***.40***	***.47***
5[a].	*.10*	*.25*
6.	***.47***[h] ***.45***[b]	***.42***[e] ***.54***[d] ***.56***[g]
8.	***.12***	***.20***[d] ***.21***[f]
10.	.04	***.31***
14.	***.27***	***.28***
15.	***.22***[b]	***.37***[d]
	.40[c]	***.41***[e]
21.	−.01	***.25***
23.	*.40*[b]	*.47*[d] *.24*[f]
24.	***.27***	***.41***
25.	.04	*.15*
28.	***.25***[b]	***.57***[d]
	.08[c]	***.50***[f]
29[a].	***.61***	***.44***
31.	*.35*	*.57*
Meta-analytic results		
k	15	18
N	5,263	6,700
$\bar{r}$	.24	.38
σ_ρ	.14	.13
95% CI	.15, .32	.31, .45

Note: Study numbers refer to studies listed in Appendix A. Multiple correlations are listed within the same study and CS/HS column when the study utilized multiple variables to measure the stressor or outcome and the strength of the relationships differed between variables. Correlations in italics are significant at .05. Bold and italics are significant at .01.

Abbreviations: CS, challenge stressors; HS, hindrance stressors.

[a]Study not included in meta-analysis.

[b]Workload.

[c]Responsibility.

[d]Role conflict.

[e]Interpersonal conflict.

[f]Role ambiguity.

[g]Organizational politics.

[h]Job demands.

relating significantly in the same direction will be considered to not support the model.

5.1 | Performance

5.1.1 | Task performance

Performance and performance-related variables have been a frequent outcome measure when testing CHM. The results from studies that examined CS–HS relationships to performance variables can be found in Table 1. Our meta-analytic results show a nonsignificant relationship between CS and performance ($\bar{r}$ = −.03), and a moderate, negative correlation for HS-performance ($\bar{r}$ = −.22, p <.05), although the confidence intervals overlap. Looking at the individual study results, only one of the seven studies which tested direct relationships between CS, HS, and traditional measures of performance (Wallace, Edwards, Arnold, Frazier, & Finch, 2009) found full support for the model in the "expected" direction, whereas three found partial support, wherein relationships from CS to performance were not significant, but HS negatively related to performance. Finally, two studies found no significant relationship between either CS or HS and performance, and one study (Zhang, LePine, Buckman, & Wei, 2014) actually found both stressor types to negatively relate to performance.

Two articles did not look at absolute relationships to performance (and as such are not included in Table 1 or the meta-analysis for lack of a direct relationship measure) instead comparing the effect of CS versus HS on performance utilizing experimental designs. In the first (Edwards et al., 2014), the task was a decision task, where either participants gained 5 cents for each correct and lost 1 cent for each incorrect choice (CS) or participants gained 1 cent for correct and lost 5 cents for each incorrect choice (HS). There was also a control where you gained or lost 3 cents for each correct and incorrect answer, respectively. The results were again mixed; Edwards et al. (2014) found no difference between the two stressors on performance in their task (i.e., correct-incorrect answers on a decision task involving winning-losing money), although they did find that the "challenge stress" group perceived significantly less stress, put in more on-task effort, and had fewer negative affective thoughts. Although the researchers did a manipulation check for the challenge/hindrance stressors, it is unclear if this is analogous to the original CS and HS (e.g., work overload and constraints) and thus may not be a true test of the model.

Similarly, Pearsall et al. (2009) extended the original model, looking at the relationship to performance when participants were exposed to no stressor (control), just CS, just HS, or a combination of CS and HS. They used the distributed dynamic decision-making simulation, where teams worked collectively to defend their region against invasion. The CS were set up with a time pressure manipulation, whereas the HS manipulation was role ambiguity (i.e., team members not given clear instructions). They found that performance was higher in the CS group than the HS group in their study, but the CS group still performed worse than the control group that was not exposed to a stressor. This is an important finding because it shows that CS may only have less of an effect than HS but still has the potential to hurt performance. Interestingly, they also found that the HS group's performance was higher than the combined stressor group that received both CS and HS, suggesting that organizations should be particularly wary of increasing CS to improve performance unless they can be certain about a lack of HS. This may further help explain the mixed findings of the other studies connecting CS/HS to performance, as it is hard to imagine a real-world scenario in which an individual is exposed to only one type of stressor exclusively.

Taken together, these results do give evidence that CS and HS, as classically defined and measured in CHM, can potentially result in differing relationships to performance. Although the results across studies are inconsistent and do not fully support the model, in general, HS are negatively related to performance, whereas CS tend not relate to performance at all. However, it does not indicate an overly large effect of HS on performance that would support CS being "better" than HS as they relate to employee performance.

5.1.2 | Organizational citizenship behavior

Organizational citizenship behavior (OCB) is defined as nontask behaviors that benefit either the organization (OCBO, e.g., going above and beyond assigned duties) or individuals within the organization (OCBI, e.g., voluntarily helping a coworker learn a new task; Ozer, 2011). The current meta-analytic results showed a nonsignificant and near-zero relationship for CS ($\bar{r}$ = .01, *n.s*) and a significant, negative relationship for HS ($\bar{r}$ = −.18, p < .05) with OCBs, similar to task performance, although the relationships were not significantly different from each other.

As seen in Table 1, the relationships for OCBs in the individual studies were extremely varied, representing nearly every possible combination of relationships with CS–HS and the outcome. Of the six studies connecting the CHM to OCBs, only one study found a relationship between CS/HS and OCBs fully supported by the model (Liu et al., 2013). Meanwhile, the other three studies found relationships that were in the same direction for CS and HS, but none agreed on the direction or size of those correlations. These results overall suggest that the CHM is not currently supported in terms of CS potentially increasing OCBs as an outcome, but that again, similar to performance, challenge stressors merely have a very small, nonsignificant relationship to OCBs.

5.1.3 | Counterproductive work behaviors

Counterproductive work behavior (CWB) is intentional behavior by employees that harms the company (e.g. theft and sabotage) and can be considered a form of "negative" performance (Fox, Spector, & Miles, 2001). Our meta-analysis results found significant positive relationships to CWBs for both CS ($\bar{r}$ = .23, p < .05) and HS ($\bar{r}$ = .32, p < .05) that were not significantly different from each other, indicating that, in general, both types of stressors relate significantly and positively to higher CWBs. Four primary studies compared CS–HS to CWBs relationships, and three of those studies (Ito &

Brotheridge, 2012; Jones, 2012; Zhang et al., 2014) found that both CS and HS had significant positive relationships with CWBs, whereas only one (Rodell & Judge, 2009) found a null relationship to CWBs for CS but a significant positive relationship to CWBs for HS (indicating partial support).

Rodell and Judge's (2009) study also tested a broader model using hierarchical linear modeling, which may help explain the inconsistent findings for OCBs and CWBs across studies. Their modeling included anxiety, anger, and attentiveness as moderators. They found offsetting indirect effects on OCBs through attentiveness and anxiety for CS and negative indirect effects for CWBs through anxiety. For HS, there was a negative indirect effect on OCBs through anxiety and positive indirect effect on CWBs through anger and anxiety. Thus, when put into this larger model, the direct effects for HS to both OCBs and CWBs were nonsignificant, whereas CS had small but significant relationships to both variables in the expected direction.

In summarizing the CHM framework in relation to CWBs, the evidence in the literature pretty clearly demonstrates both CS and HS linking to more CWBs, an undesirable outcome for organizations. If CWBs are considered to be behavioral strains, as many stress researchers classify them (Fox et al., 2001), then this finding falls in line with the results concerning strains that will be presented shortly.

5.2 | Job attitudes/retention

5.2.1 | Job satisfaction

In stress research, one negative effect that may result from job stress is lowered satisfaction with one's job (and similarly less commitment to the organization; Dawal & Taha, 2006). However, CHM would contend that although HS are related negatively to job satisfaction, CS would actually make employees more satisfied with their jobs, due to the enriching nature of these stressors (Podsakoff et al., 2007).

However, as Table 2 shows, the supposition that CS are positively related to job satisfaction is generally unfounded. The current meta-analytic results show a near-zero relationship for CS-job satisfaction ($\bar{r}$ = .02, *n.s.*), whereas HS showed a large negative relationship to the variable ($\bar{r}$ = −.46, $p < .05$), which were significantly different from one another. Although all seven studies showed that the relation between CS and HS to job satisfaction differ, only one found full support for CHM. In all seven studies, HS are strongly and negatively related to job satisfaction, which is consistent with both the CHM and traditional stress models. For CS, six studies showed nonsignificant relationships between CS and job satisfaction, partially supporting the CHM but failing to support a positive benefit for providing employees with challenge stressors. The one study that did find a moderate positive CS-job satisfaction relationship (r = .21, Ito & Brotheridge, 2012) utilized task complexity as the CS, which really fits more into the category of enriching job characteristics (Hackman & Oldham, 1980) than an actual stressor.

5.2.2 | Retention

Several studies have extended CHM beyond job satisfaction by looking at turnover-related variables, including intention to quit (ITQ; three studies), job search (two studies), and actual turnover (three studies). All of these variables are important parts of the process employees go through to plan and eventually leave an organization (Mobley, 1977).

Similar to job satisfaction, the meta-analysis results here for retention variables indicated moderate relationships for HS ($\bar{r}$ = .35 to.36) and virtually zero relationships for CS ($\bar{r}$ = −.01 to.05), with all being statistically significantly different. Thus, although we see differential relationships between CS/HS and turnover variables, there is no support for the notion that CS help in retaining employees. Across these three variables, the relationships to CS and HS were remarkably consistent across the four individual studies (encompassing 10 comparisons). They all indicated HS was positively related to retention, whereas CS always had a small, nonsignificant relationship to these variables.

Two empirical studies examined psychological withdrawal within the context of CHM. Results were mixed but again showed no full support for the CHM. The first study showed nonsignificant relationships for both types of stressors (Boswell et al., 2004). In Pearsall et al.'s experimental (2009) study, researchers found that those in the CS-only group reported less psychological withdrawal than the HS group and the combined stressor group (both CS and HS) but did not report less psychological withdrawal than the control group that was not exposed to any stressors. In addition, the HS group reported less psychological withdrawal than the combined stressor group, which reported the highest amount of psychological withdrawal.

Taken all together, although it appears that CS do not have the strong negative affect on job satisfaction and retention that HS do, CS do not have an “enriching” effect on those experiencing them either.

5.3 | Strain

5.3.1 | Psychological strain

In terms of the proportion of outcomes examined in research on the CHM, strains have been measured as the outcome more than any other variable (see Tables 3 and 4), with some types of strain included in 23 of the 31 studies discussed in this review. Burnout was examined in many of the total studies (13 of 31) and was placed in a separate table (see Table 4). The mean correlations were $\bar{r}$ = .29 for CS and .36 for HS relating to general psychological strains and $\bar{r}$ = .24 for CS and .38 for HS for burnout (neither statistically different from each other), showing negative psychological effects for both types of stressors. Overall, eight of the 10 empirical studies looking at general psychological strain (excluding burnout) found significant positive correlations for both CS and HS, whereas nine of the 13 studies found significant positive relationships for both HS and CS to burnout, showing no support for the CHM. Two studies did find nonsignificant

relationships for CS and positive relationships for HS to psychological strains (which would indicate partial support for the CHM), although the outcome variables for those two studies were an anxiety/calmness index (as well as a depression/enthusiasm; Wood & Michaelides, 2016) and an unusual measure of general well-being (i.e., the General Health Questionnaire; Lin, Ma, Wang, & Wang, 2015), which are atypical measures for psychological strain within occupational stress research.

5.3.2 | Physical strain

Only a small number (3) of studies examined the relationships between CS/HS and physical strains. The current meta results indicate small to moderate correlations for both CS and HS to physical strains, with HS being more highly correlated ($\bar{r}$ = .24 compared with .14, $p < .05$). In all the three studies though, both CS and HS were positively correlated to physical strains. Overall, this suggests both types of stressors negatively affect physical health.

5.4 | Miscellaneous outcomes

This section includes variables that do not fit under any of the other sections. Two variables for which there was partial or full support for CHM were work engagement and state positive affect (PA; see Table 3). Our meta-analytic results indicated small but opposite relationships for CS ($\bar{r}$ = .09) and HS ($\bar{r}$ = -11) to work engagement, but both relationships were nonsignificant, and CS/HS did not have significantly different relationships to the outcome. Of the three studies that looked at engagement, two found bidirectional relationships for CS and HS, fully supporting the model, although the other found a small negative relationship for both CS and HS.

Regarding PA, the mean correlation to PA for CS was positive ($\bar{r}$ = .14, $p < .05$) and HS was negative ($\bar{r}$ = −.15; confidence intervals did not overlap). Two studies found positive relationships to CS and negative relationships to HS (fully supporting the CHM), and a third found a positive relationship to CS but nonsignificant to HS (partially supporting the model). In their lab experiment, Edwards et al. (2014) also found negative affective thought was higher in the HS condition than in the CS.

The CHM has been incorporated into other areas, with similar patterns of results to those discussed above. Because these variables were not tested in at least three studies, they were not placed into the tables (or meta-analytic calculations) but are briefly discussed here. For example, Clarke (2012) meta-analytically investigated the possible differential effects of CS-HS on safety behaviors. Although she predicted positive relationships between CS and safety based on the CHM, the correlations found were either nonsignificant (.01 for safety compliance) or negative (−.11 for safety participation, $p < .05$). When looking at safety outcomes, CS were similarly unrelated to injuries (.00) and had a positive relationship to injury near misses that were nearly equal to that of HS (.16 compared with.19, both $p < .05$). Thus, all of the hypotheses relating HS and safety were supported (including the full mediation model proposed in that study), whereas none of the CS hypotheses were supported, offering partial support for the overall model. Similarly, in a survey of 271 Chinese gold mine workers, Yuan, Lee, and Lin found strong negative relationships between both CS and HS to safety participation (r = −.34, r = −.34, respectively) and safety compliance (r = −.26, r = −.37).

In another study, Widmer, Semmer, Kälin, Jacobshagen, and Meier (2012) found a small but nonsignificant positive correlation between CS (time pressure) to positive attitudes about life (PAL, r = .12, *n.s.*) and a small negative correlation for HS (rumination about work) to PAL (r = −.17, $p < .01$). The authors further tested the idea that much of the positive effects of CS in some studies have been found because of the "suppression" effect of including and controlling for HS (Widmer et al., 2012). They found the relationship between time pressure (CS) and PAL was only significant when the HS variable of uncertainty was included as a suppressor, supporting this idea.

6 | OVERALL DISCUSSION OF FINDINGS

Cavanaugh et al. (2000) proposed CHM as a novel stress concept; a needed deviation and expansion from existing stress theories which had focused solely on the negative components of stress, and a concept that, as previously discussed, has been endorsed and encouraged by a number of researchers (e.g., LePine et al., 2005; Podsakoff et al., 2007). The results depicted in this review, however, indicate that this endorsement may be unfounded. In total, only seven studies reviewed here found both CS and HS to relate significantly to the same outcome in opposite directions (e.g., LePine et al., 2005; Liu et al., 2013), most of those being for performance (three studies) and PA (two studies). Further, our meta-analytic results showed only one case for full support for the CHM (for PA), six for partial support (performance, OCB, job satisfaction, three retention variables), and four cases for unsupported (all strain-related variables: CWB, psychological strain, burnout, and physical strain). This would suggest that the CHM works better for some outcomes than others but only really supports the differential direction claim for state positive affect.

These findings would indicate only partial support for some variables in terms of the CHM based on our previous definition but may also help reconcile some of the low correlations between overall stress and job attitudes (e.g., Ostroff, 1992) in traditional stress model tests (as originally suggested by Cavanaugh et al., 2000), as the inclusion of CS in the measurement may have slightly weakened the correlations found and underestimated the true relationship between traditional or hindrance stressor measures and performance, job satisfaction, and retention.

Despite not finding full support for the model for any of the outcomes, there were differential relationships between CS/HS and several variables, foremost being performance where HS had small negative correlations to both performance and OCBs and CS had nonsignificant relationships. This is not a negligible finding, as it does suggest the field may have previously underestimated the magnitude of the negative relationships between certain stressors and work performance, in particular by using overall broad stress measures in our

studies/analyses. However, it does not show a potential increase in performance for CS, which is a troubling discovery, as one of the primary justifications researchers have used for embracing the CHM dichotomy is the supposed positive correlation between CS and performance. Given the inability to find this previously hypothesized relationship, accepting propositions of CHM does not appear, at present, to be fully justified. This is especially true when coupled with the negative relationships CS has with other important organizational and personal variables.

Based on the overall finding in this paper, we believe that to suggest that CS should be increased (as some researchers have stated, e.g., Cavanaugh et al., 2000; LePine et al., 2005) is currently unwarranted. The findings do not consistently show that CS provide any benefit to organizations and overwhelmingly show consistent positive relationship with strains. Thus, the potential negative outcomes of CS would far outweigh any potential gains.

We believe Van den Broeck, De Cuyper, De Witte, and Vansteenkiste (2010) may have best summed up CHM with this quote: "Job hindrances are threatening constraints, which deplete energy and elicit emotional-focused coping … Job challenges are obstacles that can be overcome. They require energy, but are simultaneously stimulating (p. 742)". CS create an opportunity to overcome hurdles, which may stimulate increased motivation, improve short-term performance, and even positive affect. However, they also require energy, resources, and/or coping, leading to the potential for a whole laundry list of negative physical and psychological outcomes. That is, although there is the potential for short-term gains from CS, the negative outcomes will eventually catch up to the individual and organization as the result of still experiencing stress. This will likely balance out those gains and lead to many of the nonsignificant results found in the studies presented. Just one example which supports this suggestion is the existing occupational research on overtime, which shows that the levels of performance demanded by work overload (a CS) cannot be sustained for long durations (Shepard & Clifton, 2000).

CHM advocates (e.g., Cavanaugh et al., 2000; LePine et al., 2005) state that there is good stress and bad stress, and this explains why previous research has been unable to find a consistent link to performance, a proposition with which we agree and is partially supported by the data presented here. However, another issue with CHM likely lies in the blanket distinction of any one stressor as a challenge or a hindrance (Edwards et al., 2014), as almost any stressor is going to have an element of both, a supposition supported by Webster et al. (2011). Even supporters of the model admit that further work is need on how we measure CS versus HS (e.g., Cavanaugh et al., 2000; Podsakoff et al., 2007). Certainly, some stressors may be more likely to create a feeling of challenge, but even for the most obvious "challenge" stressors, there is still likely to be a measureable amount of "hindrance." This creates major methodological issues where the hindrance presented within a CS (and vice versa) is a confounding variable lowering the expected relationships from the model. For example, high workload is considered to be a challenge stressor (Cavanaugh et al., 2000), and although this does represent an opportunity for challenge, it is also very likely that individuals will also feel at least somewhat hindered by having large workloads and/or could feel overwhelmed enough to feel no "challenge" at all. LePine et al. (2005) note that both types of stressors should lead to negative performance (conceptualized as a strain in their meta-analysis), just that the strains accrue more slowly for CS, as the indirect effect only, through fatigue caused by other strains, and not motivation itself.

Furthermore, meta-analyses show consistent negative relationships between stressors and physical health (Nixon et al., 2011) and performance (Gilboa, Shirom, Fried, & Cooper, 2008), providing additional evidence against the CHM's overall proposition. While separating out stressors into CS and HS allows for a moderation effect that deserves attention, these other findings suggest that the overwhelming experience of stressors are still negative, even for stressors that are often classified as "challenge" in CHM. Nixon et al. (2011) found that workload (a typical CS) was related to physical symptoms at *wr* = .22, which was actually higher than role ambiguity (*wr* = .15) and similar to interpersonal conflict and role conflict (typical HS; *wr* = .22 and .27, respectively).

Researchers studying CHM (e.g., LePine et al., 2005), despite finding CS were significantly and positively related to strains, continue to suggest a practical application for managers to increase CS in an effort to improve performance. LePine et al. (2005) give the caveat that this should be done as long as the strains were appropriately buffered, but that is no easy task! However, the results provided here suggest that CS do not improve performance and consistently show that no matter what type of stressor is examined, the relationship to well-being variables remains negative. Additionally, Pearsall et al. (2009) showed that exposure to both CS and HS in a lab setting resulted in the worst performance and transactional memory of their four conditions. This finding suggests that the relationship between CS and HS may be more complex than originally thought. Given that it would be very difficult to find a work environment that contained exclusively CS, the effect of adding more CS to an environment that already has HS could potentially be multiplicative in the negative effects it has for employees' performance, attitudes, and health. Our worry is that promoting CS in the workplace risks a return to the management motivation of the 1920s in a sort of reverse Taylorism; creating more challenge instead of less, but still ultimately ending up with high physical and psychological strain in a hopeless effort to increase productivity/performance. This seems a scary proposition for our field to advocate and certainly not in the spirit of what most stress and health researchers (or organizational researchers for that matter) are trying to accomplish.

6.1 | Implications and future research

To summarize, we are not proposing that CHM is completely without merit. Rather, our argument is meant to express the danger in taking those few findings which have supported the model, without understanding the full breadth of research on CHM. It is important to understand the potential issues and missing components inherent in the model, so we can study them in future and create an overall theory

that does effectively inform researchers and practitioners in ways that will not have the potential negative consequences that are present when encouraging the current CHM. The results presented here show that to date, the empirical evidence does not back up the idea of positive effects of CS.

Edwards et al. (2014) recently pointed out that the perception of a stressor as challenge versus hindrance and its relationship to performance is at least partially influenced by the severity of the stressor. This makes sense in relation to the variables originally proposed by Cavanaugh et al. (2000). For example, "mild" work overload may be seen as a challenge and lead to better performance in a task/job. But "extreme" work overload is just as likely to cause employees to perform worse and encounter any number of negative physical and emotional well-being responses (e.g., Nixon et al., 2011). It would seem to make sense that higher workload (or any of the stressors discussed here) can be helpful to a point, but that a very high level will probably diminish performance. Research may seek to understand if there is a curvilinear relationship to work outcomes, where a peak level of CS *does* lead to desirable outcomes, but beyond which negative outcomes counteract these increases.

Furthermore, one way in which researchers have begun to assess this potential limitation is by measuring the primary appraisal of stressors as challenging or hindering (e.g. Bakker & Sanz-Vergel, 2013; Webster et al., 2011). Instead of measuring/studying, for example, role ambiguity, and assuming it acts as a hindrance stressor, they suggest researchers include appraisal measures for that stressor (methodologies for which can be found in those studies). More and more research is being conducted on the CHM with this idea in mind. The study of appraisal within stress research is nothing new, as it has been included as a primary tenant of the stressor–strain relationship because the transactional model of stress was originally presented (Lazarus & Folkman, 1984). Another new but interesting concept in the stress literature, which may better explain how stressors can lead to challenge or hindrance is a recently developed and tested concept of stress mindset (Crum, Salovey, & Achor, 2013). This concept goes beyond appraisal of individual stressors or situations but looks at the individual's very conceptualization of stress itself. These variables could lead to important and interesting extensions of CHM that would hopefully result in more useful findings.

The results of this review and meta-analysis show that although CS may differ in their relationship to work-related outcomes from HS, these relationships are inconsistent at best and more often not significant. Meanwhile, CS often behave similarly to HS, showing consistent positive relationship to undesirable health variables, such as psychological strains. This should, at a minimum, give researchers pause about how the field conceptualizes and tests CHM and stop the encouragement of increasing challenge stressors in the workplace. Based on this summation and the overall lack of full support of the dichotomy between CS and HS, we propose future research focus on the specific appraisal of stressors by individuals and avoid the a priori assumptions that some stressors are inherently hindering or challenging. In order for researchers and practitioners to ultimately help real life workers suffering from the effects of stress, it is necessary to follow models that hold up to the scrutiny of empirical data and replicable findings, and currently, the CHM does not reach that bar.

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APPENDIX A.

STUDIES TESTING CHALLENGE–HINDRANCE MODEL

Study number	Reference
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