



Why and when job stressors impact voice behaviour: An ego depletion perspective

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ABSTRACT

Most research assumes that job stressors decrease employees' voice behavior. However, looking at research about job stressors and OCB (including voice), not all types of stressors have the same effects. The purpose of our research is to develop a new research model relating to the different effects of challenge stressors and hindrance stressors on voice behavior. Drawing on ego depletion theory, we propose that the relationship between stressors and voice behavior is mediated by employees' ego depletion change. Further, we tested the moderating effect of leader-member exchange (LMX) on the relationship between stressors and subsequent ego depletion. We examined the hypothesized relationships using data collected in China from 346 employees on three consecutive days. As hypothesized, we found that ego depletion mediates the relationship between stressors and voice behavior. Also, LMX strengthens the positive relationship between hindrance stressors and subsequent ego depletion. We discuss implications for research and practice.

1. Introduction

Voice is defined as speaking up in ways that challenge the status quo towards someone with the perceived power to act (Detert & Burris, 2007). Research has shown that voice is linked to organizational performance (Perlow & Williams, 2003), managerial effectiveness (Morrison, 2011) and reduced staff turnover (McClellan, Burris, & Detert, 2013). In view of these positive effects of voice in the workplace, it is important to investigate the antecedents of voice behavior. Particularly, we focus on the role of job stressors in predicting voice behavior (Morrison, 2014). Understanding how stressors facilitate or hinder voice behavior is essential for organizations, given the prevalence of job stressors.

Research has consistently supported the view that job stressors are negatively related to voice behavior. For example, Li, Liang, and Farh (2018) found that perceived organizational politics, which is a type of job stressor, decrease employees' voice behavior. Chiaburu, Marinova, and Van Dyne (2008) proposed that role overload and time pressure are negatively related to voice behavior. In a meta-analysis, Ng and Feldman (2012) found a negative relationship between various job stressors and voice behavior. However, research on the relationship between job stressors and organizational citizenship behavior (OCB), which often includes voice behavior as a key component, implies a

more complex picture. The findings suggest that not all types of stressors have negative effects on organizational citizenship behavior. Whereas hindrance stressors are negatively related to OCB, stressors that challenge employees are positively related to OCB (Rodell & Judge, 2009; Wallace, Edwards, Arnold, Frazier, & Finch, 2009). Such findings suggest the relationship between some job stressors and voice behavior could be positive, and thus the previous conclusion of an exclusively negative relation might be inaccurate.

Our study addresses this issue by differentiating between types of stressors, namely challenge stressors and hindrance stressors. We argue that different types of stressors have different effects on voice. We draw on ego depletion theory (Baumeister, Bratslavsky, Muraven, & Tice, 1998) to understand the effects of different job stressors on voice behavior. Baumeister et al. (1998) defined ego depletion as "a temporary reduction in the self's capacity to engage in volitional action caused by the prior exercise of volition" (p. 1253). We argue that challenge and hindrance stressors have opposing effects on subsequent ego depletion—the depletion of self-regulatory resources—and that ego depletion, in turn, affects voice. Challenge stressors promote mastery (Cavanaugh, Boswell, Roehling, & Boudreau, 2000) and increase self-regulatory resources (e.g., attentiveness; Rodell & Judge, 2009), which enhance individual's self-regulation capabilities and thus mitigate the depletion of self-resources depletion. However, hindrance stressors constitute

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barriers that need to be overcome, leading to an increase in the depletion of self-regulatory resources. At the same time, we expect that depleted employees will engage in less voice behavior than those who are not depleted.

We further investigate whether the self-regulatory process between stressors and voice is moderated by additional types of resources. Job demands-resources theory proposes that working conditions can be categorized into job demands and job resources. In this framework, job resources buffer the negative effects of job demands (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Research has proposed that workplace exchange relationships, especially Leader-Member Exchange (i.e., the relationship quality between leader and follower; LMX; Graen & Uhl-Bien, 1995), can provide resources that lessen the negative effects of job demands (Demerouti et al., 2001; Ng & Sorensen, 2008). Thus, drawing on job demands-resources theory and ego depletion theory, we propose that LMX moderates the relationship between job stressors and ego depletion. By combining research on LMX and job stressors, we provide insights into potential buffers to the ego depletion caused by job stressors.

This paper makes several contributions. First, it sheds further light on job stressors as antecedents of voice by differentiating between two types of stressors (challenge and hindrance). Although stress scholars have suggested that stressors can provide challenge or threat (Cavanaugh et al., 2000; Lazarus & Folkman, 1984), little research has explored these different effects on voice behavior. Our work provides a more accurate and complete understanding of the relationship between job stressors and voice behavior by clarifying that different types of stressors (challenge and hindrance) have distinct effects on voice behavior. This is important, since voice has been recognized as a positive workplace behavior (Morrison, 2011). Knowing how different stressors affect voice can help organizations target those stressors more specifically.

Second, we advance the literature by considering ego depletion as the mechanism explaining different effects of challenge and hindrance stressors on voice behavior. Although researchers have proposed ego depletion as both an inhibitor of voice (Lin & Johnson, 2015) and an outcome of job stressors (Prem, Kubicek, Diestel, & Korunka, 2016), prior research has not yet tested it directly as a mediator linking job stressors and voice behavior. Moreover, research into stressors and depletion has mainly found that job stressors consume self-regulatory resources, implying a positive relation between job stressor and ego depletion (Prem et al., 2016; Sonnentag & Jelden, 2009). Our work contributes to ego depletion theory by providing insights into how different appraisals related to stressors (namely, challenge versus hindrance) affect the limited resources pool in different ways. That is, we argue that challenge stressors are negatively related to subsequent ego depletion, while hindrance stressors consume more self-regulatory resources and are thus positively related to subsequent ego depletion.

Finally, based on a combination of ego depletion theory and job demands-resources theory, we provide a new theoretical insight regarding how LMX, a type of resource, can influence the extent to which employees' self-regulatory resources are depleted by job stressors. In other words, we investigate the moderating effect played by LMX in the relationship between job stressors and ego depletion. Culbertson, Huffman, and Alden-Anderson (2009) argue that the relationship between leaders and followers is closely related to followers' stress perceptions. However, they did not explore how LMX influences the effect of job stress. Here, we offer a new understanding of how the relationship between leaders and followers relates to the self-regulatory process used to adjusting job stressors. We also expand the boundaries of ego depletion research by identifying new conditions relevant to ego depletion. That is, while previous research proposed that personal proclivity (e.g., depletion sensitivity; Salmon, Adriaanse, De Vet, Fennis, & De Ridder, 2014) and job features (e.g., job autonomy; Prem et al., 2016) influence ego depletion, we add the interaction/relationship between leaders and followers as a possible additional contextual

condition. By demonstrating the moderating role of LMX, we add to the literature on how the two types of job stressors influence ego depletion, which in turn decreases voice behavior.

In the following sections, we develop our theoretical arguments regarding the research framework. We report our results using data from a three-wave survey of 346 employees in Mainland China. We conclude by discussing the theoretical and practical contributions of our research to knowledge about job stressors and voice behavior.

2. Theory and hypotheses

2.1. Challenge-hindrance stressors framework

Cavanaugh and colleagues introduced the challenge-hindrance stressors framework almost 20 years ago (Cavanaugh et al., 2000). It has since emerged as an important theoretical concept that helps explain the mixed results regarding the relationship between work stressors and a variety of individual and organizational outcomes (LePine, Podsakoff, & LePine, 2005; Podsakoff, LePine, & LePine, 2007). Both challenge and hindrance stressors are perceptions of the work environment, that is, they are conceptualizations of self-reported work stress (Cavanaugh et al., 2000). Challenge stressors include perceptions of workload, time pressure, job complexity, and responsibility. According to Cavanaugh et al. (2000), these types of stressors can promote mastery, personal growth, or future gains. Hindrance stressors include perceptions of role conflict, role ambiguity, politics, red tape, and job insecurity. Unlike challenge stressors, hindrance stressors constitute constraints or barriers to goal attainment or personal growth (Cavanaugh et al., 2000).

This differentiation implies that employees will perceive some stressors as challenging, rather than hindering, and that these two types of stressors relate differently to work outcomes. Indeed, research has found positive relationships between challenge stressors and positive workplace outcomes. For example, Cavanaugh et al. (2000) found a positive relationship between challenge stressors and job satisfaction and a negative relationship between challenge stressors and job search. They found the opposite pattern for hindrance stressors. Webster, Beehr, and Christiansen (2010) confirmed these results for job satisfaction: Hindrance stressors related negatively to job satisfaction, while challenge stressors related positively to job satisfaction.

2.2. Challenge stressors and ego depletion

According to ego depletion theory, people have a limited amount of self-regulatory resources (Baumeister et al., 1998). Self-control is necessary when people act against their inclinations (Baumeister et al., 1998; Quinn, Spreitzer, & Lam, 2012), and this consequently depletes their resources. In the workplace, employees need to exercise self-control and thus consume self-regulatory resources when tackling job demands that prevent them from achieving goals. That means ego-depleted employees find it more difficult to accomplish additional tasks that require self-control (Muraven & Baumeister, 2000).

Here, the differentiation between challenge and hindrance stressors is particularly relevant. Challenge stressors can facilitate employees' goal pursuit and success (Grebner, Elfering, & Semmer, 2010). Thus, challenge stressors may be less detrimental to employees than hindrance stressors. Coping with challenge stressors enhances self-development and personal growth (LePine et al., 2005). Although challenge stressors consume time and effort, such promotive stressors increase employees' intrinsic motivation as they help them achieve their goals, enhance their career development and satisfy their autonomy and competence needs. Experiments have shown that intrinsically motivated people (who believe their efforts could benefit them) perform better in subsequent tasks consuming self-regulatory resources (Muraven & Slessareva, 2003). Consequently, coping with challenge stressors increases intrinsic motivation and decreases self-regulatory

resources depletion (Ryan & Deci, 2008). Similarly, Muraven and Slessareva (2003) showed that depleted employees persist longer in subsequent self-control tasks if they believe persistence to be beneficial for them. Job responsibilities, which are a form of challenge stressor, enhance motivation, encouraging employees to regulate their behavior to meet internalized standards (Carver & Scheier, 1981), which enhances their self-efficacy (Bandura & Locke, 2003). Hence, challenge stressors can improve people's ability to cope with their daily tasks, preventing ego depletion.

Because of their relationship to mastery, personal growth, and future gains (Cavanaugh et al., 2000), challenge stressors also seem to increase positive emotions (Kark & Van Dijk, 2007), which can offset ego depletion (Tice, Baumeister, Shmueli, & Muraven, 2007). In conclusion, we assume a negative relationship between challenge stressors and subsequent ego depletion. Thus, we propose:

Hypothesis 1a: Challenge stressors are negatively related to subsequent ego depletion.

2.3. Hindrance stressors and ego depletion

In contrast, hindrance stressors force employees to invest extra energy and time to overcome barriers to task fulfilment (Grebner et al., 2010). In line with ego depletion theory, self-control involves overriding or inhibiting autonomous or habitual emotions, reactions or tendencies that would otherwise impede goal accomplishment (Baumeister, Heatherton, & Tice, 1994). Hindrance stressors impede employees' goal accomplishment because they reduce intrinsic motivation, performance, and organizational citizenship behavior (LePine et al., 2005; Wallace et al., 2009), which are desirable for employees. This means, to overcome hindrance stressors, employees have to use more self-control and self-regulatory resources than they would under normal circumstances. Consequently, coping with hindrance stressors depletes self-regulatory resources.

Moreover, unlike challenge stressors, hindrance stressors induce negative emotions in employees, such as anger and anxiety (Rodell & Judge, 2009), which consume self-regulatory resources (Muraven & Baumeister, 2000). Studies have suggested that undesired stressors hamper progress and consume additional resources and, consequently, result in ego depletion (Che, Zhou, Kessler, & Spector, 2017; Ford et al., 2014). To summarize, because of goal accomplishment impeding and negative emotions associated with hindrance stressors, we propose:

Hypothesis 1b: Hindrance stressors are positively related to subsequent ego depletion.

2.4. Relationship between stressors, ego depletion, and voice

As challenge stressors encourage positive change and could be a possible means of achieving positive change, we assume a positive relationship between those stressors and voice behavior. Hindrance stressors, in contrast, are negative factors in goals attainment and it is necessary to overcome them to achieve one's goal, which leaves little room for other prosocial activities. Therefore, we assume a negative relationship between hindrance stressors and voice behavior. Empirical results support this notion: Zhang et al. (2014) found a positive relationship between challenge stressors and performance (e.g., voice behavior) and a negative relationship between hindrance stressors and performance (e.g., voice behavior). Webster et al. (2010) results indicate a positive relationship between challenge stressors and extra-role performance towards the organization (organizational citizenship behaviors toward organization; OCB-O), of which voice is considered a part. The relationship between hindrance stressors and OCB-O was negative. Rodell and Judge (2009) also tested the relationship between challenge/hindrance stressors and citizenship behaviors, using affective events theory. They found a stronger relationship between challenge stressors and OCB than between hindrance stressors and OCB. Anxiety mediated the relationship between hindrance stressors and OCB, such

that the relationship became negative.

To summarize, these results indicate that challenge stressors increase voice while hindrance stressors reduces it. At the same time, we argue that ego depletion mediates the relationship between stressors and subsequent voice behavior. Specifically, in line with Liu, Zhu, and Yang (2010), we maintain that voice contains an element of risk, as it challenges the status quo. That means voice is resource consuming. However, when employees are ego depleted, they will not act in ways that consume further resources, in line with resource conservation theory. Previous studies support this notion. For example, Schmeichel, Vohs, and Baumeister (2003) have shown that ego depletion reduces people's ability to solve complex problems. More closely related to our study, Lin and Johnson (2015) found that employees were unlikely to have the necessary willpower to speak up (voice) when they felt depleted. Thus, we assume that ego depletion will reduce subsequent resource consuming behaviors, such as voice.

Taking these arguments together, we argue that ego depletion mediates the relationship between stressors and voice. More specifically, we assume a positive relationship between challenge stressors and employees' voice, because challenge stressors decrease employees' ego depletion. In contrast, we assume a negative relationship between hindrance stressors and employees' voice behavior, because hindrance stressors increase employees' ego depletion. Based on the above reasoning, we propose that ego depletion mediates the relationship between challenge-hindrance stressors and voice behavior. Consequently, we propose:

Hypothesis 2a: Ego depletion mediates the positive relationship between challenge stressors and voice.

Hypothesis 2b: Ego depletion mediates the negative relationship between hindrance stressors and voice.

2.5. The moderating effect of Leader-Member exchange

Leader-member exchange describes the relationship quality between a leader and each of his/her followers (dyadic relationships, Graen & Uhl-Bien, 1995). According to leader-member exchange theory, a leader can have different relationships with each of his/her followers (Graen & Uhl-Bien, 1995; Graen, 1976). Employees who share a high-quality relationship with their supervisor will benefit from more supervisor support (Graen & Uhl-Bien, 1995).¹

In the relationship between stressors, ego-depletion, and voice, we argue that, in line with Demerouti et al. (2001), job resources can buffer the negative effects of job stressors. Followers in high quality exchanges are less likely to perceive stress than those in low quality exchanges (Nelson, Basu, & Purdie, 1998). A good relationship with one's leader can serve as a job resource in times of high stress, as leaders are in a position to modify tasks or react to voice in a way that changes the stress experience (Major & Morganson, 2011). Consequently, we argue that the relationship between a leader and his/ her followers is relevant in the context of stress and voice. Employees in a good LMX relationship will feel themselves to be in-group members, whereas others will feel they are in the out-group (Dansereau, Graen, & Haga, 1975). In-group members receive more information, confidence, and concern from the manager (Liden & Graen, 1980). Gomez and Rosen (2001) found that

¹ We would like to thank an anonymous reviewer for suggesting that the concept of Guanxi might be more relevant in the Chinese context. While we agree that Guanxi is very relevant in the relationship between supervisors and their followers in China, we also agree with Zhang, Deng, and Wang (2014) and Zhang, Lam, and Deng (2017) on the differences between LMX and Guanxi. Zhang et al. (2014) note: "LMX theory is strictly restricted to work-related exchanges. Supervisor-subordinate guanxi, however, is primarily developed through informal interactions between a subordinate and his/her supervisor after work and the exchanges involved cover a wide range of social and economic benefits." (p. 661). Since in our study, we are interested in work-related resources, we consider LMX the more relevant moderator for our study.

employees in strong LMX relationships perceive more empowerment by their leader, which can mitigate their exhaustion at work (Ben-Zur & Yagil, 2005). Employees in higher quality LMX relationships are less likely to perceive job stressors (Nelson et al., 1998). Results by Atwater and Carmeli (2009) also suggested that high LMX is associated with high levels of motivation and energy related to problem-solving.

Thus, we propose that LMX serves as an additional resource that strengthens self-regulatory resources, hence promoting the effect of challenge stressors and further decreasing ego depletion. That is, LMX moderates the relationship between challenge stressors and ego depletion, such that the relationship is stronger when LMX is high. Similarly, LMX can buffer the detrimental effect of hindrance stressors, as the resources provided by a positive relationship with their supervisor make it easier for employees to implement self-control processes, leading to less self-regulatory resource consumption. McCarthy, Trougakos, and Cheng (2016) also found that high LMX serves as external resource that can mitigate employees' internal resource depletion (see also Sonnentag & Pundt, 2016). Consequently, we argue that LMX moderates the relationship between challenge/hindrance stressors and ego depletion, such that a high-quality LMX relationship with one's supervisor increases the negative relationship between challenge stressors and ego depletion and reduces the positive relationship between hindrance stressors and ego depletion. Thus, we propose the following hypothesis:

Hypothesis 3a: LMX moderates the relationship between challenge stressors and ego depletion, such that the negative relationship is stronger when employees perceive higher LMX.

Hypothesis 3b: LMX moderates the relationship between hindrance stressors and ego depletion, such that the positive relationship is weaker when employees perceive higher LMX.

3. Method

3.1. Sample and procedure

We obtained data for this study from employees of three branches in a manufacturing organization in the People's Republic of China. The organization mainly produced missile, radar, and related military products. We initially distributed the questionnaire to 420 participants and received complete data from 346 (response rate: 82.4%). The final sample consisted of 60.7% male, and 39.3% female employees; their average age was 32 years old ($SD = 6.46$; 21–30 years: 50.3%, 31–40 years: 38.4%, and 41 years and older: 11.3%). In terms of education, 13.1% held degrees from junior college or lower degrees, 33.1% held bachelor degrees, and 53.5% held master or higher degree. The average organizational tenure was 7.67 years ($SD = 7.20$, range from less than 1 year to 40 years). Regarding job position, 92.1% were general staff, and 7.9% were department leaders or above. Participants included professional or technical staff, administrators, clerks, and maintenance/support staff. About 60.8% of the participants were technical staff. Participation in the study was voluntary. All participants were informed that the purpose of the survey was to examine human resource practices and were assured of the confidentiality of their responses.

In line with previous research suggesting that ego depletion varies daily (Sonnentag, 2003; Trougakos, Beal, Cheng, Hideg, & Zweig, 2015; Trougakos, Beal, Green, & Weiss, 2008), we collected data in the afternoons of three consecutive workdays. On the first day, employees provided information regarding their challenge stressors, hindrance stressors, and LMX, as well as demographic variables (age, gender, education etc.). We also assessed the baseline levels of ego depletion and voice behavior. On the second day, employees provided ratings regarding their ego depletion for that day. Finally, on the third day, employees rated their voice behavior for that day. Field studies have shown that the effects of depletion carry over from one day to the next (Lanaj, Johnson, & Barnes, 2014; Lin & Johnson, 2015). Thus, our

multi-wave design over consecutive days is suitable for testing our hypotheses regarding ego depletion.

3.2. Instruments

The questionnaires were administered in Chinese. We used Brislin (1980) back-translation procedure to translate all questionnaires from English to Chinese. After finishing the translation, we invited two employees to check whether the items were clear and accurate. We reworded a few items to ensure clarity, based on their feedback. Unless otherwise indicated, response scales ranged from 1 (strongly disagree) to 5 (strongly agree).

Challenge and Hindrance stressors. We assessed hindrance and challenge stressors using the measure of Cavanaugh et al. (2000). However, we used an adaptation of the response scale suggested by Webster et al. (2010) to clarify that the items refer to work experiences that reflect the inherent promotive or prohibitive features of challenge and hindrance stressors. Specifically, we changed the response format used by Cavanaugh et al. (2000), which ranges from 1 “produces no stress” to 5 “produces a great deal of stress” to Webster's (2010), which ranges from 1 “strongly disagree” to 5 “strongly agree”. The measure consists of five hindrance-related items and six challenge-related items. An example hindrance-related item is “I need to go through a large amount of red tape to get my job done” and a sample item of challenge stressors was “My position entails a large scope of responsibilities”. Prior empirical research supported the assumed two-dimensional factor structure and showed good reliabilities for the subscales (Cavanaugh et al., 2000; Webster et al., 2010). We had to delete one of the hindrance stressors items, namely, “I cannot clearly understand what is expected of me on the job” after the exploratory factor analysis, due to its low factor loading. A previous empirical study conducted in China had the same issue with this item (Lee, 2011). The reliability for challenge stressors and hindrance stressor were $\alpha = 0.89$ and $\alpha = 0.72$, respectively, in the present study.

Ego depletion. We used the five-item instrument developed by Twenge, Muraven, and Tice (2004) to assess ego-depletion. Sample items are “I feel drained right now”, “Right now, it would take a lot of effort for me to concentrate on something”, and “Right now, I feel like my willpower is gone”. The same items were used to measure ego depletion on day 1 (baseline, $\alpha = 0.86$) and day 2 ($\alpha = 0.85$).

Leader-member exchange. Leader-member exchange was assessed using Liden and Maslyn (1998) 12-item scale, LMX-MDM. Participants responded to statements such as “I like my supervisor very much as a person”. In line with previous practice, we consider the instrument as one-dimensional. We removed two items (“I do work for my supervisor that goes beyond what is specified in my job description” and “I do not mind working my hardest for my supervisor”), both relating to contribution, in light of the results of the principal components analysis. The contribution subscale is often found to be the weakest sub-dimension of LMX-MDM (e.g., Schyns, Paul, Mohr, & Blank, 2005). A factor analysis supported the one-dimensional structure, with 50.26% of total variance explained by the first factor. We summed up the remaining 10 items to create a one-dimensional variable. The reliability of this measure in our study was $\alpha = 0.90$.

Voice behavior. We used Van Dyne and LePine (1998) six-item instrument to assess employees' voice behavior. We assessed baseline voice behavior on day 1. To assess this concept on day 3, we changed the statements to include a reference to the day. Sample items read “Today, I developed and made recommendations concerning issues that affect the work group”, and “Today, I communicated my opinions about work issues to others in this group even if my opinion is different from others”. After removing one item (“Today, I spoke up in this group with ideas for new projects or changes in procedures”) that was not expected to vary daily, we used five items to assess daily voice behavior (baseline $\alpha = 0.89$; current $\alpha = 0.88$).

Control variables. We controlled for implicit voice theories,

Table 1
Descriptive statistics and intercorrelations of variables.

	1	2	3	4	5	6	7	8
1. Ego depletion (Day 1)								
2. Voice behavior (Day 1)	−0.17**							
3. Challenge stressors	0.25**	0.16*						
4. Hindrance stressors	0.43**	−0.21**	0.22**					
5. Ego depletion (Day 2)	0.84**	−0.15**	0.11*	0.50**				
6. Voice behavior (Day 3)	−0.15**	0.95**	0.13*	−0.25**	−0.17**			
7. Leader-member exchange	−0.35**	0.36**	0.03	−0.32**	−0.29**	0.34**		
8. Implicit voice theories	0.36**	−0.19**	0.26**	0.51**	0.39**	−0.22**	−0.22**	
Mean	2.69	3.62	3.55	2.63	2.65	3.60	3.60	3.13
SD	0.86	0.75	0.65	0.71	0.83	0.73	0.57	0.54

Note: N = 346. * $p < 0.05$, ** $p < 0.01$.

because these refer to employees' apprehension that voice leads to negative consequences, which influences employees' decision to speak up (Detert & Edmondson, 2011). We used the 20-item scale by Detert and Edmondson (2011) to assess employees' implicit voice theories. A sample item is "It's risky to challenge existing processes because it may be seen as questioning the wisdom of the individuals who established or supported them". We deleted one item ("If you want advancement opportunities in today's world, you have to be careful about pointing out needs for improvement to those in charge") after the exploratory factor analysis. The reliability of this measure in our study was $\alpha = 0.89$.

4. Results

4.1. Descriptive statistics, validity, and reliability

We conducted a confirmatory factor analysis (CFA) on the above measures to examine their construct validity. For leader-member exchange and implicit voice theories, we used scale scores of the sub-dimensions to indicate the respective factors. For all other study constructs, we used individual items as indicators for the latent variables. We first assessed the fit of a six-factor measurement model that included the focal predictor (day 1 challenge and hindrance stressors), mediator (day 2 ego depletion), moderator (leader-member exchange), control variable (implicit voice theories) and outcome (day 3 voice behavior). We based all model fit tests and comparisons on the final sample of $N = 346$. Based on the modification indices, we allowed error covariance between two challenge stressors items (i.e., "scope of responsibility" and "amount of responsibility") as these two item stems are similar (Boswell, Olson-Buchanan, & LePine, 2004), and between two implicit voice theory factors with similar meanings (i.e., "don't bypass the boss upward" and "don't embarrass the boss in public"). The six-factor model fit was acceptable: $\chi^2 = 653.03$, $df = 333$, CFI = 0.93, RMSEA = 0.05, SRMR = 0.07, and all loadings were significant.

We compared this six-factor model with several alternative models using χ^2 difference tests. The χ^2 difference tests showed that fit was significantly worse for the alternative models. Specifically, (a) the six-factor model fits the data significantly better than a five-factor model combining challenge and hindrance stressors into one factor ($\Delta\chi^2 = 410.45$, $df = 5$, $p < .01$). The fit of this model was: $\chi^2 = 1045.49$, $df = 338$, CFI = 0.84, RMSEA = 0.08, SRMR = 0.12. (b) The six-factor model fits the data significantly better than a five-factor model combining voice behavior and implicit voice theories into one factor ($\Delta\chi^2 = 443.33$, $df = 5$, $p < .01$). The fit of this model was: $\chi^2 = 1097.37$, $df = 338$, CFI = 0.83, RMSEA = 0.08, SRMR = 0.12. (c) The six-factor model fits the data significantly better than a four-factor model that collapsed challenge stressors, hindrance stressors, and ego depletion items into one factor ($\Delta\chi^2 = 1160.56$, $df = 9$, $p < .01$). The fit of this model was: $\chi^2 = 1813.59$, $df = 342$, CFI = 0.67, RMSEA = 0.11, SRMR = 0.15. These model comparison results

supported the construct validity of our set of focal variables. Therefore, we tested our hypotheses using the six-factor solution. Table 1 shows the descriptive statistics and correlations between the focal variables.²

4.2. Hypotheses tests

As shown in Table 1, challenge stressors related positively to ego depletion (Day 2) ($r = 0.11$, $p < .05$). Hindrance stressors related positively to ego depletion (Day 2) ($r = 0.50$, $p < .01$), providing initial support for H1b but not for H1a. Moreover, challenge stressors related positively to voice behavior (Day 3) ($r = 0.13$, $p < .05$), while hindrance stressors related negatively to voice behavior (Day 3) ($r = -0.25$, $p < .01$).

We tested the entire model via path analysis, using Mplus 7.11. In addition to the relationships shown in Fig. 1, we controlled for the baseline variables by including paths from each baseline variable to its counterpart in the model. Specifically, we included a path from baseline voice behavior to day 3 voice behavior, and a path from baseline ego depletion to day 2 ego depletion. Fig. 1 displays the estimated standardized path coefficients for each path in the model. The path from challenge stressors to subsequent ego depletion was negative and significant ($\beta = -0.14$, $p < .001$), supporting H1a. The path from hindrance stressors to subsequent ego depletion was positive and significant ($\beta = 0.16$, $p < .001$), supporting H1b. Moreover, ego depletion at the end of the day was a significant negative predictor of employee voice behavior ($\beta = -0.10$, $p < .001$).

The fact that the direct effects of challenge and hindrance stressors on ego depletion and that of ego depletion on voice behavior significantly supported the possibility of an indirect effect. To test the indirect effect of challenge stressors and hindrance stressors on voice behavior via ego depletion, we used the procedure recommended by Preacher and Hayes (2008). Our results indicate that ego depletion mediates the relationship between challenge stressors and voice behavior. The indirect effect through depletion (estimate = 0.02; 95% confidence interval CI = [0.00, 0.03]) was significant. Ego depletion had a significant indirect effect (estimate = -0.02 ; 95% confidence interval CI = [-0.03 , -0.00]) on the relationship between hindrance stressors and voice behavior. Overall, we found support for Hypothesis 2a and 2b, which predicted that ego depletion would mediate the relationship between challenge-hindrance stressors and voice behavior.²

²Because of the high correlations between day 1 and day 2 ego depletion, we conducted supplementary analyses. Specifically, we split our sample in terms of high and low stressors. We found that in the group high in challenge stressors, the change in ego depletion from day 1 to day 2 is significant (decrease). This change is not significant in the group low in challenge stressors. For the group high in hindrance stressors, the change in ego depletion from day 1 to day 2 is not significant. This change is, however, significant in the group low in challenge stressors (decrease). The full analyses are available from the first author.

³The separate effects of the two types of stressors are similar to the results in the whole model. Separate effect of challenge stressors on subsequent ego

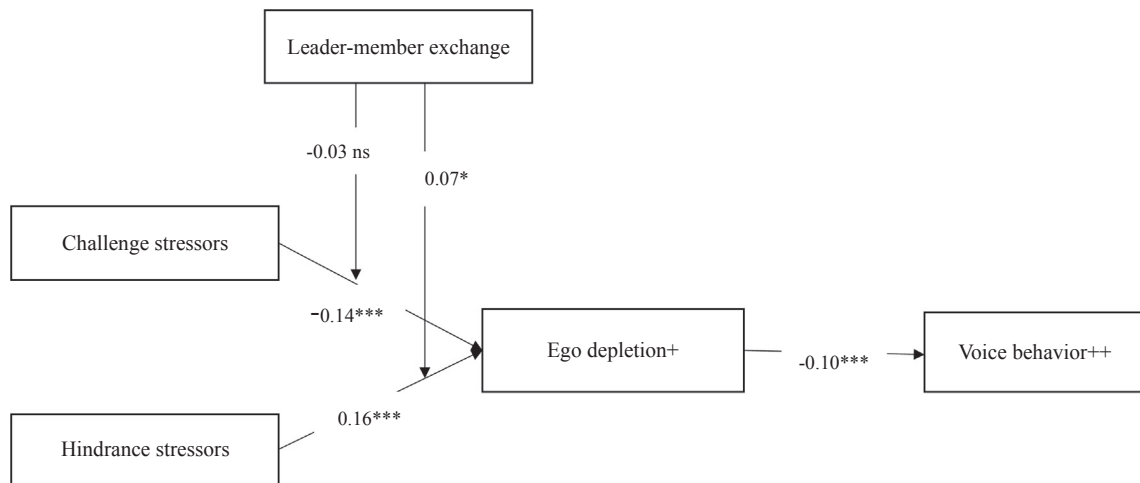


Fig. 1. Standardized path analysis results. Note: Standardized path estimates are reported in the figure. + Controlling for Baseline level of ego depletion; ++ Controlling for Baseline level of voice behavior.

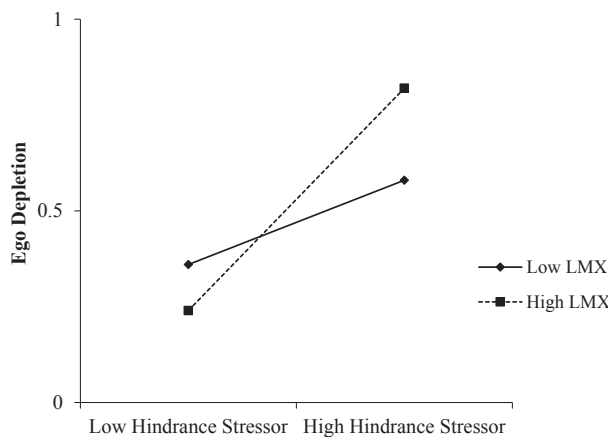


Fig. 2. The moderating effect of leader-member exchange on the relationship between hindrance stressor and ego depletion.

Fig. 1 summarizes the moderating effects of leader-member exchange. LMX did not moderate the challenge stressors–ego depletion relationship ($\beta = -0.03, n.s.$), providing no support for H3a. However, LMX did moderate the relationship between hindrance stressors and ego depletion ($\beta = 0.07, p < .05$). Fig. 2 depicts the interaction plot based on values plus and minus one standard deviation from the mean of the moderating variable (i.e., LMX; Cohen, Cohen, West, & Aiken, 2013). The plot showed a more positive relationship between hindrance stressors and ego depletion for employees who rate their LMX as good, than for employees who rate their LMX as poor. The slope was significant when LMX was high ($b = 0.22, p < .00$) and low ($b = 0.13, p < .01$), and the two slopes were marginally different from each other ($b = 0.09, p < .1$). Therefore, the results contradict our assumption. We found no support for Hypothesis 3b, which stated that LMX would buffer the negative effect of hindrance stressors on ego depletion.

To assess the moderated mediation effect further, we used procedures recommended by Edwards and Lambert (2007). Our results showed that LMX significantly moderated the relationship between hindrance stressors and ego depletion, thus we tested the first-stage moderated-mediation model. Specifically, we expected the indirect effect of hindrance stressors on voice behavior via ego depletion to vary

(footnote continued)

depletion ($\beta = -0.14, p < .001$). Separate effect of hindrance stressors on subsequent ego depletion ($\beta = 0.20, p < .001$).

at high and low levels of LMX (one standard deviation above and below the average). We described the direct, indirect, and total effects of hindrance stressors on voice behavior at high and low levels of LMX and examined the significance of the indirect effect using bootstrapped 95% CIs. For employees high in LMX, results revealed a non-significant conditional indirect effect of hindrance stressors (95% CIs between -0.05 and 0.00). Nor was the conditional indirect effect significant for employees low in LMX (95% CIs between -0.03 and 0.00). Thus, we found no support for the moderated mediation effect of hindrance stressors.

4.3. Post hoc analysis

To explore further why LMX failed to moderate the relationship between job stressors and ego depletion in the expected directions, we conducted a post-hoc analysis on the curvilinear relationship between LMX and ego depletion, based on previous findings of a curvilinear relationship between LMX and stress (Harris & Kacmar, 2006). We found a U-shaped relationship between LMX and ego depletion ($\beta = 0.041, p < .001, R^2 = 0.086$). Not only is this result consistent with previous findings (Harris & Kacmar, 2006), it can also help to explain the non-significant and unexpected moderating effects of LMX and the unsupported moderated-mediation effects.

5. Discussion

In this study, we investigated the relationship between challenge-hindrance stressors and voice behavior, drawing on the ego depletion perspective. Based on a sample of 346 employees, our findings support the assumption that ego depletion relates negatively to challenge stressors and positively to hindrance stressors. Thus, employees who rate their levels of challenge stressors as high tend to report less ego depletion, whereas employees who perceive high levels of hindrance stressors tend to report more ego depletion. This study also found a negative relationship between ego depletion and voice behavior. Moreover, our findings indicate that ego depletion mediates the relationships between challenge-hindrance stressors and voice behavior. The positive effect of challenge stressors on voice behavior works indirectly through the decrease of ego depletion and the negative effect of hindrance stressors on voice behavior works indirectly via the increase of ego depletion.

In addition, our findings indicate that for employees who rate their LMX relationship with their supervisors as good, the negative relationship between hindrance stressors and ego depletion is stronger. That is, for employees high in LMX, hindrance stressors are associated

with higher ego depletion than for those in low LMX relationships. For the latter, the relationship between hindrance stressors and ego depletion remains positive, but is weaker. This was contrary to our expectations that LMX would serve as a buffer of the negative relationship between hindrance stressors and ego depletion. Also, we found no support for the moderating role of LMX on the relationship between challenge stressors and ego depletion, although the pattern of the moderation was in the predicted direction. One possible explanation is that challenge stressors already alleviate ego depletion. Arguably, ego depletion might already be low, making it less likely to reduce further when LMX improves, due to a ceiling/floor effect.

5.1. Theoretical implications

Our research enhances knowledge about challenge and hindrance stressors and their relationship with voice behavior, in several important ways. First, we contribute to the voice literature by distinguishing between challenge and hindrance stressors as antecedents. Previous studies into job stressors and voice behavior did not differentiate between challenge and hindrance stressors, but rather combined them into one measurement (Ng & Feldman, 2012). Our results confirmed that not all job stressors are negatively related to voice behavior. Hindrance stressors are indeed negatively related to it, but challenge stressors are positively related to voice behavior. Although both challenge and hindrance stressors induce strain, challenge stressors promote employees' autonomous self-regulation process, which mitigates their resource depletion and increases voice. Thus, the general conclusion that job stressors are negatively related to voice behavior is likely to be mainly driven by hindrance stressors. Our study provides a more complete and accurate view of the relationship between job stressors and voice behavior by differentiating between different types of stressors.

Second, we found that ego depletion mediated the effects of job stressors on voice behavior. In particular, the ego depletion mechanism expands the cognitive appraisal approach (i.e., transactional stress model) to understanding the effects of job stressors. Job stressor researchers have long assumed that individuals appraise stressors as challenging or threatening according to their ability to deal with them, which further induces productive or counter-productive behaviors (Lazarus & Folkman, 1984). In recent years, scholars have explored other approaches to extend understanding of mechanisms by which job stressors affect employees, pointing out the importance of self-regulation (Mackey & Perrewé, 2014; Prem et al., 2016). By demonstrating that stressors influence voice behavior via ego depletion, our study supports this view from the ego depletion perspective. In addition, our study improves understanding of how the dynamic process relating to stressors affects voice behavior through the mediation of ego depletion change. We used a three-day survey design, which explored changes in ego depletion and voice behavior caused by job stressors.

In contrast to previous studies that found a positive relationship between job stressors and ego depletion (Sonnentag & Jelden, 2009), our results indicate that not all job stressors deplete resources. That is, when employees consider a stressor as a challenge, subsequent ego depletion is less likely to occur than when they consider the stressor as a hindrance (that they have to cope with), because challenge stressors are beneficial for goal accomplishment and personal development, which increase employees' intrinsic motivation. Intrinsically motivated self-control actions can lead to less depletion than those which are externally enforced (Muraven, Gagné, & Rosman, 2008). This is consistent with the self-determination assumption in the self-control strength model, which has received empirical support (e.g., Prem et al., 2016).

Our study also contributes to the literature by examining whether LMX buffers the negative effect of hindrance stressors on ego depletion, and thus by integrating ego depletion theory with the job demand-resource model. Contrary to our hypothesis, we found that the negative effect of hindrance stressors on voice behavior is stronger when

employees have better LMX relationships. While counterintuitive at first sight, our results are consistent with findings by Harris and Kacmar (2006), who found a curvilinear relationship between LMX and negative individual outcomes. Their results showed that people in high-quality LMX relationships can perceive more stress than those in moderate-quality relationships, because the supervisor may delegate more, and they may feel obliged to perform particularly well because of the good relationship. Similarly, Baer et al. (2015) found that feeling trusted by a supervisor can lead to stronger emotional exhaustion via a higher perceived workload. On the other hand, a good relationship with a leader can buffer employees' exhaustion, because leaders are in a position to modify tasks (Major & Morganson, 2011; Nelson et al., 1998). Considering these arguments, our finding underlines the fact that good LMX can be a double-edged sword with regard to followers' stress and depletion. Although our research provides empirical support for the view that high-quality LMX can intensify the depleting effect of hindrance stressors, further investigation is needed to explore when this is true and when it can buffer this effect.

5.2. Practical implications

Our research has implications for both managers and employees. First, it highlights the importance of considering daily job experiences such as job stressors. Previous studies have focused on the benefits of voice behavior and organizational factors that could influence it (Detert & Burris, 2007; Li & Sun, 2015; McClean et al., 2013). However, we demonstrate the importance for organizations to consider employees' perceptions of their daily job experiences. Managers must be careful when allocating job demands to employees and help them understand and cope with work stressors in view of the different effects of challenge and hindrance stressors.

This study provides evidence that employees' ego depletion state is substantially related to voice behavior. We therefore recommend that employees should pay attention to their own regulatory energy and try to identify resources or behaviors that help avoid depletion. The same applies to organizations and supervisors: They should help employees to manage their regulatory resources, for example, by developing cognitive and emotional regulation training courses (Troughakos et al., 2015), or by establishing a safety climate in the organization.

Finally, this study provides guidance to managers regarding relationships with subordinates. Hindrance stressors are likely to discourage employees who have a good relationship with their leader from engaging in voice behavior. One explanation for this result is that employees in good relationships with their leader feel more vulnerable to additional stressors. Thus, managers may need to consider carefully how such employees perceive stressors.

5.3. Limitations and future research

This study has some limitations, which future studies will need to address. First, all our variables were self-reported by employees, though at different times. We cannot therefore completely rule out common method bias. In addition, we required subordinates to think of their direct leaders when completing the survey. Unfortunately, we were not able to collect any data on which supervisor they rated, due to data anonymity and privacy concerns. This also means that we had no information about our participants' group membership, and so could not conduct multi-level analyses. Since our assessment of voice was related to the group our participants worked in, even though we asked for their individual contribution to voice in the group, this represents a limitation that future research needs to address. Future studies could obtain data from different sources (e.g., by asking supervisors to rate focal employees' voice behavior) or by using the multilevel method to control the nesting issue.

Second, although we used data collected on three consecutive workdays to capture the daily change of ego depletion, considering its

temporary nature and daily variation and recovery (Sonnentag, 2003; Trougakos et al., 2008, 2015), other measuring strategies have their strengths as well. Future studies could examine our assumptions by extending the survey to longer (e.g., weekly, monthly) cycles, testing changes over a longer period. Experimental designs could be adopted to ensure causality and to capture ego depletion more rigorously (Baumeister et al., 1998).

Although we used challenge and hindrance stressors in line with the theoretical differentiation (Cavanaugh et al., 2000), challenge and hindrance stressors are broad in scope. The problem with measuring broad categories of challenge and hindrance stressors is that this mainly captures the appraisal or the nature of stressors (González-Morales & Neves, 2015; Zhang et al., 2014). Future research should measure specific subcategories, such as time pressure, role overload, and role conflict, to replicate and strengthen our findings. Moreover, voice is only one kind of organizational citizenship behavior. We did not investigate other organizational citizenship behaviors that can be influenced by job stressors. Future studies need to establish a more comprehensive model to strengthen the ego depletion explanation.

In addition, besides the moderating effect of LMX examined in this study, other contingent variables could be considered. For example, different self-regulatory strategies substantially influence behavior regulation (Higgins & Spiegel, 2004). Specifically, people high in promotion focus might still use voice when ego depleted, as they focus on achieving their goals by acting. In contrast, people high in prevention focus might prefer to conserve their resources to avoid the risk of additional stressors. Previous studies also found that people have different levels of depletion sensitivity, which means that their self-control resources diminish at different rates (Salmon et al., 2014). That means stressors influence ego depletion differently, depending on people's depletion sensitivity. Future studies should consider different perspectives or theories to explain the boundary conditions of the relationship between job stressors and ego depletion.

Finally, we used a sample from China, which is considered a collectivistic culture (Hofstede & Hofstede, 2001). Collectivist subordinates may tolerate challenge and hindrance stressors better than individualistic subordinates, as they might consider group goals more than their individual levels of stress. Moreover, we collected our data in a relatively bureaucratic state-owned enterprise. We assume that in such a context, voice is likely to vary less than in an entrepreneurial type of company that is subject to more change. The context of our study might limit the generalizability of our findings to other cultural contexts (Pellegrini & Scandura, 2008). Future research should investigate whether the relationships we identified here generalize to other cultural contexts.

6. Conclusion

In this research, we explored the relationship between challenge and hindrance stressors and voice behavior, based on ego-depletion theory. Our results show that it is essential to distinguish between challenge and hindrance stressors, as the perception of challenge stressors on one day is associated with a decrease in ego depletion on the following day, while hindrance stressors are associated with an increase in ego depletion on the following day. Our results also show that LMX can increase the negative effect of hindrance stressors on ego depletion. As such, we contribute to understanding of how challenge and hindrance stressors influence voice behavior from an ego depletion perspective.

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Declarations of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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