# Does Voice Benefit or Harm Occupational Well-Being? The Role of Job Insecurity

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**Abstract**

Although employee voice is integral for organisational functioning, it is not well-understood how voice affects occupational well-being, particularly when jobs are perceived as insecure. Drawing from the dual-pathway model of proactivity, which is based on self-determination and conservation of resources theories, we integrate theorising on the well-being consequences of voice with the job insecurity literature. First, we hypothesise that voice leads to increases in both vigour and fatigue. Second, we propose that job insecurity moderates these effects, such that the effect of voice on increases in vigour is stronger (weaker) when job insecurity is low (high), whereas the effect of voice on increases in fatigue is stronger (weaker) when job insecurity is high (low). 733 full-time employees in Germany participated in two surveys three months apart. Results largely supported our predictions and showed that voice led to increases in vigour. Moreover, voice predicted increases (decreases) in fatigue when job insecurity was high (low). However, voice and job insecurity did not interact in predicting changes in vigour. Reverse causal analyses showed no effects of vigour and fatigue on changes in voice. Our discussion focuses on why and how perceptions of employment relations should be considered to determine well-being consequences of voice.

*Keywords:* voice; job insecurity; vigour; fatigue

## Does Voice Benefit or Harm Occupational Well-Being? The Role of Job Insecurity

Employee voice has been shown to be beneficial for organisational functioning, error prevention, and innovation (Detert et al., 2013; Knoll et al., 2016). At the individual level, voice is a form of proactive behaviour that entails employees voluntarily and informally communicating work-related suggestions or concerns to others with the intent to affect constructive change (Morrison, 2014; van Dyne & LePine, 1998). While different proactive behaviours are strongly related (Tornau & Frese, 2013), voice is conceptually and empirically distinct from other discretionary behaviours aimed at changes in the organisation (Parker & Collins, 2010), including personal initiative (i.e., self-starting and persistent proactive behaviour; Frese & Fay, 2001) or taking charge (i.e., voluntary and constructive efforts to affect functional change; Morrison & Phelps, 1999). In contrast to these behaviours, voice implies a fundamental challenge to the status quo (Hirschman, 1970; LePine & van Dyne, 1998; van Dyne et al., 2003) and, therefore, is not necessarily appreciated by others in the organisation (Parker & Collins, 2010; van Dyne et al., 2003). Advocating for new ideas or articulating concerns can be perceived as disruptive, as it threatens routines, hierarchies, and established organisational harmony (Detert & Burris, 2007; Milliken et al., 2003). Further, superiors may perceive voice as undue or disloyal and punish employees for speaking up (Burris, 2012). Thus, engaging in voice may lead to harmful consequences, such as loss of career opportunities or damaged relationships with co-workers and superiors (LePine & van Dyne, 1998; Milliken et al., 2003; Ng & Feldman, 2012; van Dyne et al., 2003).

Previous research has focused on performance-related and social-perceptual outcomes of voice, such as perceptions of organisational justice, job attitudes, relational outcomes, and social status (Bashshur & Oc, 2015; Thomas et al., 2010; Weiss & Morrison, 2019). In contrast, the

possibility that voice can affect employee well-being has been largely neglected (see Starzyk et al., 2018, for an exception). This is surprising, given that voice is a highly resource-demanding behaviour that requires employees to defend alternative viewpoints and talk about potentially uncomfortable issues. A lack of knowledge on how voice may affect well-being is problematic as poor well-being may lead to withdrawal, increased turnover, and deterioration of health (Wilson et al., 2004). Negative reactions from others and career consequences can potentially damage the well-being of employees engaging in voice (Bolino et al., 2010; Ng & Feldman, 2012). However, voice may also entail positive consequences. When employees perceive that they can freely express their opinions and affect changes in the organisation, they act in accordance with their true self and, consequently, experience higher well-being (Kahn, 1999; Knoll & van Dick, 2013).

Due to the potentially two-sided nature of the consequences of voice, we suggest that the recently developed dual-pathway model of proactivity is a useful framework to address the question of how voice affects employee well-being (Cangiano & Parker, 2016). Focusing on proactive behaviour in general, the model suggests that proactive behaviour constitutes a double-edged sword for well-being. Specifically, behaviours such as voice may both lead to well-being via an "energy-generating pathway" and to strain via a "resource-depleting pathway" (Cangiano et al., 2018; Cangiano & Parker, 2016; Hobfoll, 1989).

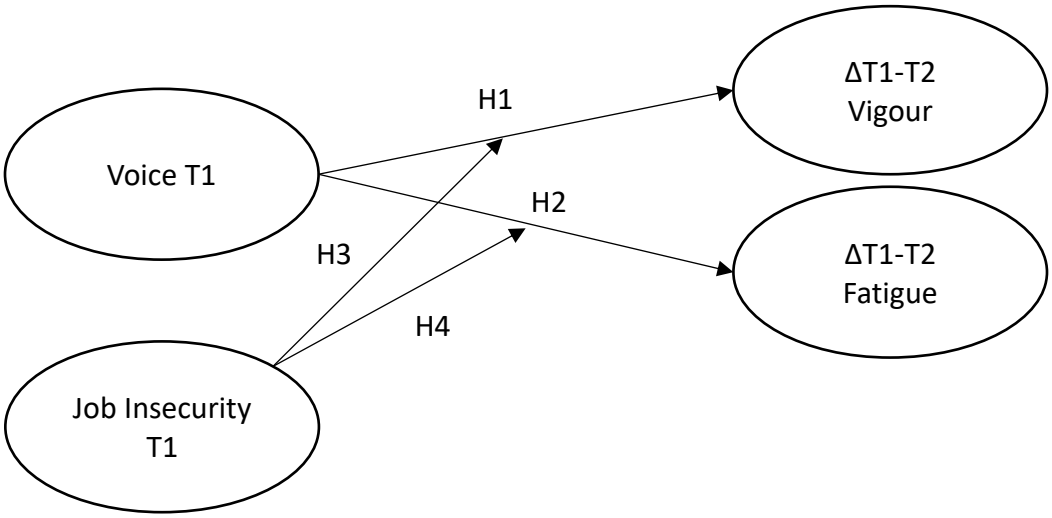
Building on the dual-pathway model of proactivity and the underlying energetic processes it proposes, we focus on two important and complementary occupational well-being outcomes that reflect energetic activation and resource depletion. *Vigour* is a dimension of positive affect that involves high levels of emotional energy and mental resilience at work, coupled with experiences of contentment and pleasantness (Bakker & Demerouti, 2008; Quinn et

al., 2012; Shirom, 2011). It is a measure of human energy and considered the key aspect of work engagement (Seipp, 2020; Shirom, 2011). In contrast, *emotional work fatigue* (henceforth abbreviated as *fatigue*) is a dimension of strain and lack of energy. It entails both a feeling of immense tiredness and a reduced capacity and/or motivation to deal with input (Frone & Tidwell, 2015).

We propose that engaging in voice leads to increases in both vigour and fatigue over time. However, because voice is always embedded in a specific organisational and employment context, its consequences are affected by factors on multiple levels (Morrison, 2014; Wilkinson et al., 2020; Wilkinson & Fay, 2011). Employees consider their social context to determine whether voice is risky or not and how it will affect them once they have engaged in it (Detert & Edmondson, 2011; Edmondson, 1999). Thus, we focus on an important social-perceptual moderator that may explain how voice affects well-being. We propose that job insecurity moderates the relationships between voice and the two well-being outcomes, vigour and fatigue. *Job insecurity* is defined as employees' concern that their job is at risk and may not exist in the future (de Witte, 1999). It has repeatedly been shown to constitute an important risk factor for work-related strain, including vigour and fatigue (de Witte et al., 2016). Moreover, job insecurity is an increasingly common phenomenon that may act as a stressful condition or, in the case of high job security, as a resource for employees engaging in voice (Mauno et al., 2014). In contrast to other individual perceptions of the work context, such as psychological safety, job insecurity is a particularly harmful threat that implies potential loss of employment and its associated financial and social resources (de Witte, 1999; Jahoda, 1982). It represents a link between micro- and meso-level factors as it captures employees' perceptions of the meso-level context. Our conceptual model and hypotheses are shown in Figure 1.

**Figure 1**

*Hypothesised Model*




*Note.* T = Time; H = Hypothesis; Δ = Change.

We aim to investigate the link between voice and well-being and to determine how job insecurity shapes the well-being outcomes of voice. Thereby, we contribute to the literatures on voice and occupational well-being in three meaningful ways. First, we respond to repeated calls to broaden the criterion domain of proactive behaviour, specifically voice, beyond performance-related outcomes (Bolino et al., 2010; Cangiano & Parker, 2016). We focus on voice as a fundamentally challenging proactive behaviour that may entail opposing well-being effects. We also broaden the dual-pathway model of proactivity by including an important contextual moderator that has been neglected in the context of voice, namely job insecurity. Previous research demonstrated moderating effects of punitive supervision and perceived organisational support on the resource-depleting pathway (Cangiano et al., 2018; Zacher et al., 2019). However, it remains to be understood how perceptions of one's job as more or less secure interact with the two pathways.

Second, by examining job insecurity as a moderator, we identify a key employment-related condition that may determine whether voice has positive or negative effects on well-being. Previous research has focused on employees' proactive efforts to cope with job insecurity (e.g., Stiglbauer & Batinic, 2015) or has investigated how voice is influenced by stressful working conditions (Ng & Feldman, 2012). We investigate how voice impacts on well-being in situations characterised by different levels of job insecurity. Thus, our research provides micro-level insights into the well-being consequences of voice against the background of an increasingly insecure and precarious employment context (Kalleberg, 2009). Finally, we expect voice to be a recurrent behaviour that has an unfolding and dynamically accumulating effect on well-being (Frese & Zapf, 1988). With our two-wave study design, we are able to draw relatively strong conclusions regarding the causal direction of effects by explaining change in occupational well-being due to voice (Bashshur & Oc, 2015; Selig & Preacher, 2009). Indeed, several studies have shown work energy to affect the level of voice (e.g., Carnevale et al., 2018; Schmitt et al., 2017). Accordingly, we supplement our main analyses with tests of reverse effects of well-being and job insecurity on changes in voice.

## Theoretical Background and Hypothesis Development

### Effects of Voice on Increases in Vigour and Fatigue

Voice has been defined as "informal and discretionary communication by an employee of ideas, suggestions, concerns, information about problems, or opinions about work-related issues to persons who might be able to take appropriate action" (Morrison, 2014, p.174). As such, it is integral for organisational functioning, evident, for example, in uncovering organisational misconduct. In her review, Morrison (2014) proposed a conceptual framework differentiating between antecedents and consequences of voice. The majority of research to date focuses on

antecedents of voice, such as personality, leadership, or organisational factors (e.g., Edmondson, 2003; LePine & van Dyne, 2001; Morrison et al., 2011). Most research on the consequences of voice has focused on performance and social outcomes for the individual, suggesting that constructively expressed voice can lead to elevated performance ratings and higher social status among employees (Burris, 2012; Weiss & Morrison, 2019; Whiting et al., 2012).

However, what is missing is a thorough understanding of how voice as a challenging and, thus, highly demanding behaviour affects employee well-being. Even though research has shown that voice can be a means to cope with workplace stressors (Ng & Feldman, 2012), it is not clear how voice itself affects well-being. To shed more light on this issue, we draw on the dual-pathway model of proactivity by Cangiano and Parker (2016), which is based on self-determination theory (Ryan & Deci, 2000) and conservation of resources (COR) theory (Hobfoll, 1989). Based on this model, we argue that voice can impact well-being via two antagonistic pathways, an energy-generating pathway and a resource-depleting pathway. Vigour and fatigue represent opposite states of energetic activation and well-being. Yet, they are distinct energy constructs and not two ends of the same continuum (Demerouti et al., 2010; Mäkikangas et al., 2012). Therefore, they could both be positively influenced by voice. Whereas vigour, in itself a goal for people, has been shown to relate to other positive consequences (e.g., motivation, physical health; Chida & Steptoe, 2008; Shirom, 2011), fatigue can lead to serious health problems if activation and overload are sustained (Meijman & Mulder, 1998).

The dual-pathway model of proactivity suggests that proactive behaviour can positively affect well-being, here operationalised as vigour, via an energy-generating pathway, because it contributes to the fulfilment of the basic needs for competence, autonomy, and relatedness (Ryan & Deci, 2000; Strauss & Parker, 2014). For voice behaviour, this pathway can materialise in

three ways. First, engaging in voice is, in a positive sense, challenging (Fay & Sonnentag, 2012) and, thus, can promote experiences of mastery and competence (Massimini & Carli, 1988). Second, voice is self-initiated and typically intrinsically motivated (Cangiano & Parker, 2016). It can therefore enhance feelings of autonomy, control, and authenticity that are conducive to well-being (Cangiano et al., 2018; Knoll & van Dick, 2013). Third, voice can improve relations with others at work by asking for feedback or sharing novel ideas, thus contributing to the need of relatedness (Strauss & Parker, 2014). Voice can also improve relationships at work, and high-quality relationships have been found to be invigorating (Cangiano & Parker, 2016; Shirom, 2011). Empirically, an initial study that examined the dual-pathway model confirmed the validity of the energy-generating pathway. In a daily diary study, Cangiano et al. (2018) showed that proactive behaviour is positively associated with experienced competence and vitality. In addition, two earlier studies found a positive relationship between voice and work engagement (Cheng et al., 2013; Rees et al., 2013).

Voice may also entail negative well-being consequences via the resource-depleting pathway. According to COR theory, individuals strive to protect the resources they value and to seize new resources (Hobfoll, 1989). The process underlying the resource-depleting pathway implies that an increase in resource investments through proactivity diminishes existing resources and inhibits the acquisition of new resources (Cangiano & Parker, 2016; Janssen et al., 2004). Consistently, Bolino et al. (2010) emphasise that proactive behaviours necessitate the investment of personal resources, such as time and energy. This should especially hold true for voice, which is particularly demanding (Ng & Feldman, 2012). Indeed, a recent study showed that voice both necessitates and depletes self-regulatory resources (Xia et al., 2020). Voice involves a resource-demanding goal-regulation process of envisioning, planning, enacting, and

reflecting that requires spending existing resources and does not necessarily foster resource acquisition (Bindl et al., 2012). In addition, voice might result in role overload as employees who often speak up take on additional tasks outside their job description (Bolino & Turnley, 2005). Accordingly, employees showing higher initiative in the workplace experience greater psychological costs, including role overload, job stress, and work-to-family conflict (Bolino & Turnley, 2005). Research indicates that, assessed on a daily basis, proactivity predicts fatigue (Fay & Hüttges, 2017). Finally, voice also involves psychological risk as it can be perceived as a threat to the status quo, may be opposed by others (Bolino et al., 2010), and may not always fulfil the need of relatedness but, instead, can also increase conflict at work (Spychala & Sonnentag, 2011). Therefore, while resource investment is necessary for the protection, restoration, and acquisition of resources, consecutive resource protection and acquisition cannot be taken for granted in the case of voice due to the risk implied when speaking up. The first principle of COR theory postulates that (the threat of) resource loss is more salient than resource gain (Hobfoll, 2011). This suggests that resource depletion and, subsequently, feelings of fatigue, may follow voice behaviour (Zijlstra et al., 2014).

Previous research has found preliminary evidence for the postulated resource-depleting pathway. A daily diary study found that proactive behaviour was positively related to anxiety and negatively related to detachment, but only when punitive supervision was high (Cangiano et al., 2018). A longitudinal study across one year found negative effects of personal initiative on negative affect, but only when perceived organisational support was low (Zacher et al., 2019).

In summary, based on Cangiano and Parker's (2016) dual-pathway model and its proposition that proactive behaviour can affect occupational well-being by being both "energy-generating" and "resource-depleting," we expect voice to simultaneously have positive effects on

increases in vigour and fatigue. As occupational well-being can change dynamically within employees over time (Frese & Zapf, 1988), we measure changes over a time lag of three months, following recommendations for optimal time lags and based on the assumption that the effects of voice can unfold in this time lag (Dorman & Griffin, 2015).

*Hypothesis 1:* Voice has a positive effect on increases in vigour.

*Hypothesis 2:* Voice has a positive effect on increases in fatigue.

**Job Insecurity as a Moderator**

The embeddedness of voice in the specific organisational and employment context suggests differential consequences for voice behaviour depending on meso- or macro-level factors (Morrison, 2014; Wilkinson et al., 2020; Wilkinson & Fay, 2011). Employees perceive those context factors and may act and feel correspondingly. We argue that the perception of the employment situation, particularly in the form of job insecurity, moderates the relationship between voice and well-being. Job insecurity is of rising practical relevance, as organisational behaviour increasingly takes place in complex and insecure environments (Cangiano & Parker, 2016; Kalleberg, 2009). Between 9% and 54% of European employees feel threatened by job loss, depending on factors like place of residence, national economy, sectorial, or demographic variables (de Witte et al., 2015). From a theoretical perspective, job insecurity plausibly impacts the energy-generating and resource-depleting pathways from voice to vigour and fatigue.

Job insecurity is considered a hindrance stressor, that is, a job demand impeding well-being that has repeatedly been shown to negatively affect mental health (Cavanaugh et al., 2000; de Witte et al., 2016; Schreurs et al., 2015). Previously, the impact of stressors (and resources) on the use of voice has received far more attention than the impact of voice under the presence of stressors (e.g., Berntson et al., 2010; Breevaart et al., 2020). Voice challenges the status quo and,

thus, likely interacts with job insecurity in predicting well-being because employees with high job insecurity may fear even more backlash from superiors when they engage in voice (Detert & Edmondson, 2011). Moreover, when job insecurity is high, employees may feel more pressured to show voice to prove their performance in order to secure their employment. Knoll et al. (2016) argued that when voice is a required organisational behaviour, it may lead to negative employee outcomes. Voice has traditionally been positioned as a psychologically important opportunity to influence one's working conditions. However, the possibility to remain silent may likewise be essential for well-being under insecure conditions, as withholding voice can be used as a tool of employee resistance and exertion of power (Bies, 2009; Donaghey et al., 2011; Knoll et al., 2016). Different motives to voice (e.g., to keep ones job) may lead to different outcomes (Bormann & Rowold, 2016; Chamberlin et al., 2017; Knoll et al., 2016; Starzyk et al., 2018). When it is perceived as a necessity due to contextual demands or insecurities, engaging in voice should be more stressful (Cangiano & Parker, 2016). In the context of job insecurity, high job insecurity places additional demands on employees or pressures them to express concerns when they fear for their employment already. These arguments suggest that high job insecurity impedes the energy-generating and strengthens the resource-depleting effect of voice.

Regarding the energy-generating pathway, we have argued that voice leads to increased vigour because it helps fulfil individuals' basic needs. We further argue that job insecurity negatively affects the positive impact of voice on vigour, because it impedes the energy-generating pathway from voice to vigour. We expect voice to lead to stronger increases in vigour when job insecurity is low, as the energy-generating pathway is undisturbed by a hindrance stressor and the basic needs can be met via a sense of mastery and control (Mauno et al., 2014; Ryan & Deci, 2000; van den Broeck et al., 2008; Zijlstra et al., 2014). If job insecurity is high,

however, this pathway is disturbed, and basic needs fulfilment is not possible as feelings of competence and relatedness are impeded (Seipp, 2020). Voice is also less likely to satisfy an individuals' need for autonomy when hindrance stressors are present (Strauss et al., 2017). Voice may further be conceived as less meaningful when job insecurity is high as employees might feel that they will not benefit from potential changes in the organisation (Breevaart & Tims, 2019). Thus, high (vs. low) job insecurity should weaken the invigorating effect of voice behaviour.

In the voice literature, the positive interplay of resources like trust or positive leader-member exchange with voice and work engagement has been well established (Cheng et al., 2013; Rees et al., 2013). Further, feeling psychologically safe at work has been established to be an essential condition for a positive link between risky proactive behaviour and well-being (Baer & Frese, 2003).

*Hypothesis 3:* Job insecurity moderates the effect of voice on increases in vigour, such that the effect is stronger when job insecurity is low and weaker when job insecurity is high.

In contrast, with regard to the resource-depleting pathway, voice should less strongly lead to increases in fatigue when job insecurity is low and more strongly lead to increases in fatigue when job insecurity is high. Under high job insecurity, voice is more likely to be accompanied by feelings of organisational injustice, low psychological safety, pressure to show voice behaviour, and personal threat (Cangiano & Parker, 2016; Knoll et al., 2016). Investing resources through voice behaviour while being threatened by resource loss and potentially feeling under pressure to show voice will, following the COR theory principle of heightened vulnerability under stressful conditions, further intensify resource depletion. Therefore, it will intensify the experienced fatigue that we expect to follow voice behaviour either way.

Furthermore, voice requires self-control and depletes self-regulatory resources (Xia et al., 2020). Engaging in voice can be expected to drain more self-regulatory resources under high job insecurity due to being externally motivated and to a heightened fear of backlash. Therefore, stronger depletion of self-regulatory resources will ensue (Baumeister et al.,1998; Quinn et al., 2012; Xia et al., 2020). Further, employees may feel that their efforts to improve organisational functioning are under-appreciated when experiencing job insecurity. Previous research shows that innovative behaviour, which entails that individuals speak up with novel ideas or suggestions, is more likely to induce job-related anxiety and burnout when perceived organisational fairness is low (Janssen, 2003, 2004). Moreover, the resource-depleting pathway of proactive behaviour has been replicated under conditions of punitive supervision (Cangiano et al., 2018).

*Hypothesis 4:* Job insecurity moderates the effect of voice on increases in fatigue, such that the effect is weaker when job insecurity is low and stronger when job insecurity is high.

## Method

### Participants and Procedure

This study was approved by the Ethics Advisory Board of University XXX (No. XXX, Study Title: XXX). Data were collected from 733 employees in Germany at two measurement points (Time T1 and T2) with a time lag of three months. The data were part of a larger data collection effort and other manuscripts based on this dataset address completely different research questions. So far, one article based on this dataset has been published (topic: age inclusive HR practices, age diversity climate, and work ability; authors blinded for review).

We commissioned an online research company to recruit participants. Initially, in August of 2017 (T1), 5,798 invitations were sent to individuals in the companies' database. In total,

1,152 individuals followed this invitation and provided basic demographic information (19.9% response rate). Of these, 946 indicated working full-time and completed the survey at T1. At T2, data was provided by 733 employees (22.5% dropout rate).

Participants included 429 men (58.5%) and 304 women (41.5%). Ages ranged from 20 to 73 years, with an average age of 44.14 years (SD = 12.36). Average job tenure was 16.41 years (*SD* = 12.29). In terms of educational level, two (0.2%) had no qualification, 54 (7.4%) finished general secondary school, 202 (27.6%) finished intermediate secondary school, 109 (14.9%) had obtained a high school degree, 97 (13.2%) held a technical college/applied university degree, and 269 (36.7%) held a university degree. Participants worked in a broad range of sectors (e.g., education, health services, administration, sales, computer engineering).

We used independent sample t-tests to compare participants, who participated at both measurement waves, with participants, who participated at T1 only, in the core T1 variables (voice, job insecurity, vigour, fatigue), as well as age, sex, and education. There were no significant differences in these variables between the two groups, except that women ($N_{\text{T1 and T2}}$ = 304; $N_{\text{T1 only}}$ = 221) were more likely to drop out than men ($N_{\text{T1 and T2}}$ = 429; $N_{\text{T1 only}}$ =170; $\chi^2(1)$ = 23.20, $p < .001$). Following Goodman & Blum (1996) and adjusting for multiple comparisons, we compared the variances of the focal variables between participants participating at T1 only and participants participating in both measurement waves. The variances did not differ significantly. The correlations among T1 voice, job insecurity, vigour, and fatigue did not significantly differ between "T1 and T2 respondents" and "T1 only respondents," except for the correlations between voice and vigour ("T1 and T2": $r$ = .37; "T1 only": $r$ = .52; $p$ = .019). However, the correlation is higher among "T1 only respondents" and, thus, we can expect our estimation to be more conservative.

## Measures

We asked participants to reflect on their work-related attitudes and behaviour in the past three months. All items were worded in active past tense.

### *Voice*

We measured employee voice behaviour at T1 and T2 with the 6-item voice scale from van Dyne and LePine (1998). Two example items are "I communicated my opinions about work issues to others in my work group even if my opinion was different and others in the group disagreed with me" and "I spoke up in my work group with ideas for new projects or changes in procedures." The responses were made on 5-point scales ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Alphas were .92 at T1 and .93 at T2.

### *Job insecurity*

We assessed job insecurity at T1 and T2 with four items from the Copenhagen psychosocial questionnaire (Kristensen et al., 2005). The items were preceded by the phrase "In the last three months, I worried about…". Two example items are "…becoming unemployed" and "…new technology making me redundant." The responses were made on 5-point scales ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Alphas were .84 at T1 and .87 at T2.

### *Vigour*

We assessed vigour at T1 and T2 with the six items from the Utrecht work engagement scale (Schaufeli et al., 2002). Two example items are "At my job, I felt strong and vigorous" and "At my work, I felt bursting with energy." Responses were provided on a scale ranging from 1 (*never*) to 7 (*always*). Alphas were .90 at T1 and .91 at T2.

### *Fatigue*

We measured fatigue at T1 and T2 with three emotional work fatigue items (Frone & Tidwell, 2015). The items were preceded by the phrase "In the last three months, how often…". Two example items are "…did you feel emotionally worn out at the end of the workday?" and "…did you have difficulty showing and dealing with emotions at the end of the workday?" Responses were provided on a scale ranging from 1 (*never*) to 5 (*always*). Alphas were .90 at T1 and .94 at T2.

## Statistical Analyses

We conducted the following four sets of analyses with the software Mplus (Muthén & Muthén, 1998-2017). First, we ran confirmatory factor analyses (CFA) to examine our measurement model at both time points. Second, we examined configural and metric equivalence of the latent variables, separately and in combination, across the two measurement points. At both measurement points, we used the items as indicators of the latent voice variable. Establishing equivalence of measurement models and factor loadings is necessary to ensure that comparisons on the latent variables are valid across time points (van de Schoot et al., 2012). We assumed that an acceptable model fit was indicated by comparative fit index (CFI) values greater than .90, root mean square error of approximation (RMSEA) values smaller than or close to .08, and standardised root mean square residual (SRMR) values smaller than or close to .08 (Browne & Cudeck, 1993; Hu & Bentler, 1999).

Third, we tested our hypotheses using a combination of a latent difference score (LDS) approach and a latent moderated structural (LMS) equations approach (see also Bamberger et al., 2017). This approach is more appropriate for the test of models incorporating change in constructs over time than traditional moderated-mediation analysis and cross-lagged panel

models. In particular, the use of LDS variables addresses the problem of measurement error and allows examining the effect of one variable on change in another variable over time (Selig & Preacher, 2009). We included T1 job insecurity, T1 voice, as well as T1 and T2 vigour and fatigue as latent variables in the model and, using the XWITH command in Mplus, specified latent interaction effects of T1 job insecurity and T1 voice on T1-T2 change (Δ) in vigour and fatigue. Importantly, ΔT1-T2 vigour and ΔT1-T2 fatigue are a function of their respective T1 and T2 latent variables. To define these variables, we (a) fixed the loadings of the paths from each change variable to its respective T2 latent variable to 1 and set the residual variance to 0, (b) specified the T2 latent variables as a function of their respective T1 latent variables, with weightings fixed to 1 and residual variance set to 0, and (c) regressed the change variables on their respective latent T1 variables (Bamberger et al., 2017; Selig & Preacher, 2009; Zacher et al., 2019). We also imposed measurement invariance by holding the loadings of the factor indicators equal over time (see Mplus syntax in the Appendix).

Mplus does not provide traditional fit indices for models including latent variable interactions (Maslowsky et al., 2015). However, methodologists have recommended an alternative two-step approach for assessing the fit of LMS models (Klein & Moosbrugger, 2000; Muthen, 2012). Specifically, CFI, TLI, RMSEA, and $\chi^2$ values are obtained from a model without the interaction term (Model 1). The relative fit of this model and a model including the latent interactions (Model 2) is compared using a log likelihood ratio test. Specifically, this test estimates whether the more parsimonious model without interactions represents a significant loss in fit relative to the more complex model with interactions (Bamberger et al., 2017; Maslowsky et al., 2015). Finally, as a supplementary analysis, we tested a reverse causal model (Model 3) by adding T2 voice and ΔT1-T2 voice, effects of T1 vigour, and fatigue on ΔT1-T2 voice, as well as

interactive effects of T1 job insecurity with T1 vigour and fatigue, respectively, on ΔT1-T2 voice to the hypothesised model.

## Results

The descriptive statistics and correlations are shown in Table 1. The stability (i.e., autocorrelations) of voice, vigour, and fatigue across the two measurement points ranged from .63 to .66 ($p < .001$). Voice was positively correlated with vigour, but not significantly correlated with fatigue and job insecurity. Moreover, job insecurity was negatively correlated with vigour and positively correlated with fatigue, and vigour and fatigue were negatively intercorrelated.

**Table 1**

*Descriptive Statistics and Correlations*

| | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| 1. T1 Voice | 3.30 | 0.96 | (.92) | | | | | | |
| 2. T2 Voice | 3.34 | 0.93 | .66** | (.93) | | | | | |
| 3. T1 Job insecurity | 1.88 | 0.97 | -.06 | .00 | (.84) | | | | |
| 4. T1 Vigour | 4.20 | 1.15 | .37** | .27** | -.24** | (.90) | | | |
| 5. T2 Vigour | 4.21 | 1.14 | .32** | .35** | -.15** | .64** | (.91) | | |
| 6. T1 Fatigue | 2.27 | 1.03 | -.02 | .00 | .51** | -.38** | -.28** | (.90) | |
| 7. T2 Fatigue | 2.30 | 1.05 | -.02 | .03 | .43** | -.33** | -.34** | .63** | (.94) |

*Note.* $N = 733$; T = Time; alphas are reported in parentheses along the diagonal; * $p < .05$; ** $p < .01$.

**Dimensionality of Study Variables**

CFAs showed that the variables differed from each other at both measurement occasions (Table 2). Specifically, for the T1 data, a 4-factor model (with voice, job insecurity, vigour, and fatigue) had an adequate fit to the data ($\chi^2$[df=146] = 793.909, $p < .001$, CFI = .935, TLI = .924, RMSEA = .078, SRMR = .046) and fitted the data better than a 3-factor model (with vigour and fatigue indicators loading on the same factor) and a 1-factor model (with all indicators loading on a single factor). Similar results were obtained for the T2 data (Table 2).

**Measurement Equivalence**

Table 3 shows the results of the configural (i.e., free factor loadings) and metric equivalence analyses (i.e., factor loadings invariant). Constraining the factor loadings to be equal across time in the metric equivalence analyses did not substantially change the fit for each latent variable and the combination of the four variables. Specifically, changes in CFI, TLI, RMSEA, and SRMR were lower than recommended cut-off values of ΔCFI/TLI greater than -.010, ΔRMSEA smaller than .015, and ΔSRMR smaller than .030 (Chen, 2007; Cheung & Rensvold, 2002), suggesting that measures were equivalent across time points.

**Table 2**

*Results of Confirmatory Factor Analyses*

| Time point | Model | $\chi^2$ | df | *p* | CFI | TLI | RMSEA | SRMR |
|---|---|---|---|---|---|---|---|---|
| Time 1 | Four factors: Voice, job insecurity, vigour, fatigue | 793.909 | 146 | <.001 | .935 | .924 | .078 | .046 |
| | Three factors: Voice, job insecurity, vigour+fatigue | 2423.295 | 149 | <.001 | .771 | .738 | .144 | .117 |
| | One factor | 6267.668 | 152 | <.001 | .385 | .308 | .234 | .206 |
| Time 2 | Four factors: Voice, job insecurity, vigour, fatigue | 739.804 | 146 | <.001 | .944 | .934 | .074 | .047 |
| | Three factors: Voice, job insecurity, vigour+fatigue | 3305.152 | 149 | <.001 | .702 | .757 | .170 | .174 |
| | One factor[a] | | | | | | | |

*Note.* [a]Model did not converge.

**Table 3**

*Results of Measurement Equivalence Analyses*

| | $\chi^2$ | df | CFI | TLI | RMSEA | SRMR | ΔCFI | ΔTLI | ΔRMSEA | ΔSRMR |
|---|---|---|---|---|---|---|---|---|---|---|
| *All Four Factors* | | | | | | | | | | |
| Configural Invariance | 2029.558 | 626 | .939 | .932 | .055 | .049 | | | | |
| Metric Invariance | 1921.906 | 633 | .950 | .944 | .046 | .046 | .011 | .012 | -.009 | -.003 |
| *Voice* | | | | | | | | | | |
| Configural Invariance | 249.483 | 50 | .972 | .963 | .074 | .027 | | | | |
| Metric Invariance | 275.183 | 52 | .972 | .965 | .067 | .028 | .000 | .002 | -.007 | .001 |
| *Job Insecurity* | | | | | | | | | | |
| Configural Invariance | 44.818 | 15 | .992 | .985 | .052 | .018 | | | | |
| Metric Invariance | 59.494 | 18 | .990 | .984 | .050 | .023 | -.002 | -.001 | -.002 | .005 |
| *Vigour* | | | | | | | | | | |
| Configural Invariance | 675.133 | 47 | .912 | .877 | .135 | .066 | | | | |
| Metric Invariance | 734.993 | 52 | .915 | .892 | .119 | .062 | .003 | .015 | -.016 | -.004 |
| *Fatigue* | | | | | | | | | | |
| Configural Invariance | 8.431 | 5 | .999 | .997 | .031 | .008 | | | | |
| Metric Invariance | 8.159 | 7 | 1.000 | .999 | .013 | .008 | .001 | .002 | -.021 | .000 |

**Hypothesis Tests**

Results of the three structural equation models are shown in Table 4. The model without interaction terms (Model 1) fit the data well ($\chi 2[335] = 1294.621$, $p < .001$, CFI = .942, TLI = .935, RMSEA = .063, SRMR = .051). This model allows testing Hypotheses 1 and 2. According to Hypothesis 1, voice has a positive effect on increases in vigour. This hypothesis was supported by a positive effect of T1 voice on ΔT1-T2 vigour (.09, $p = .009$). Hypothesis 2 states that voice has a positive effect on increases in fatigue. As T1 voice did not have a significant effect on ΔT1-T2 fatigue (Table 4, Model 1), this hypothesis was not supported.

Model 2 in Table 1 additionally contains the interaction effects of voice and job insecurity on changes in vigour and fatigue, respectively. According to Hypothesis 3, job insecurity moderates the positive effect of voice on increases in vigour, such that the effect is stronger when job insecurity is low and weaker when job insecurity is high. As shown in Table 4, the interaction effect between voice and job insecurity on vigour was non-significant. Voice seems to affect increases in vigour independent of the level of job insecurity. Thus, Hypothesis 3 was not supported.

Hypothesis 4 states that job insecurity moderates the effect of voice on increases in fatigue, such that the effect is weaker when job insecurity is low and stronger when job insecurity is high. Voice did not have a significant main effect on change in fatigue, but job insecurity (.17, $p < .001$) and the interaction between voice and job insecurity (.12, $p = .002$) significantly predicted change in fatigue (Table 4, Model 2). Simple slope analyses revealed that the effect of voice on decreases in fatigue was positive when job insecurity was low (i.e., -1 SD; simple slope = -.10, $p = .030$). In contrast, the effect of voice on increases in fatigue was positive when job insecurity was high (i.e., +1 SD; simple slope = .13, $p = .015$). This interaction effect is

shown in Figure 2. The effect of voice on change in fatigue seems to depend on the level of job insecurity that employees' experience. Consistent with Hypothesis 4, voice increases fatigue when job insecurity is high. Unexpectedly, the effect of voice on increases in fatigue was not only weaker when job insecurity was low, but even led to decreases in fatigue. We assessed the fit of the model with interaction effects (Model 2) by comparing it to the model without interaction effects (Model 1). The result (-2*Δlog likelihood [df = 2] = 7.45, $p < .05$) indicates that the elimination of the interaction terms would result in a significant loss in model fit. This suggests that, similar to Model 1 without interactions, Model 2 with interactions fits the data well (Maslowsky et al., 2015).

**Figure 2**

*Effect of Voice on Change in Fatigue Moderated by Job Insecurity*

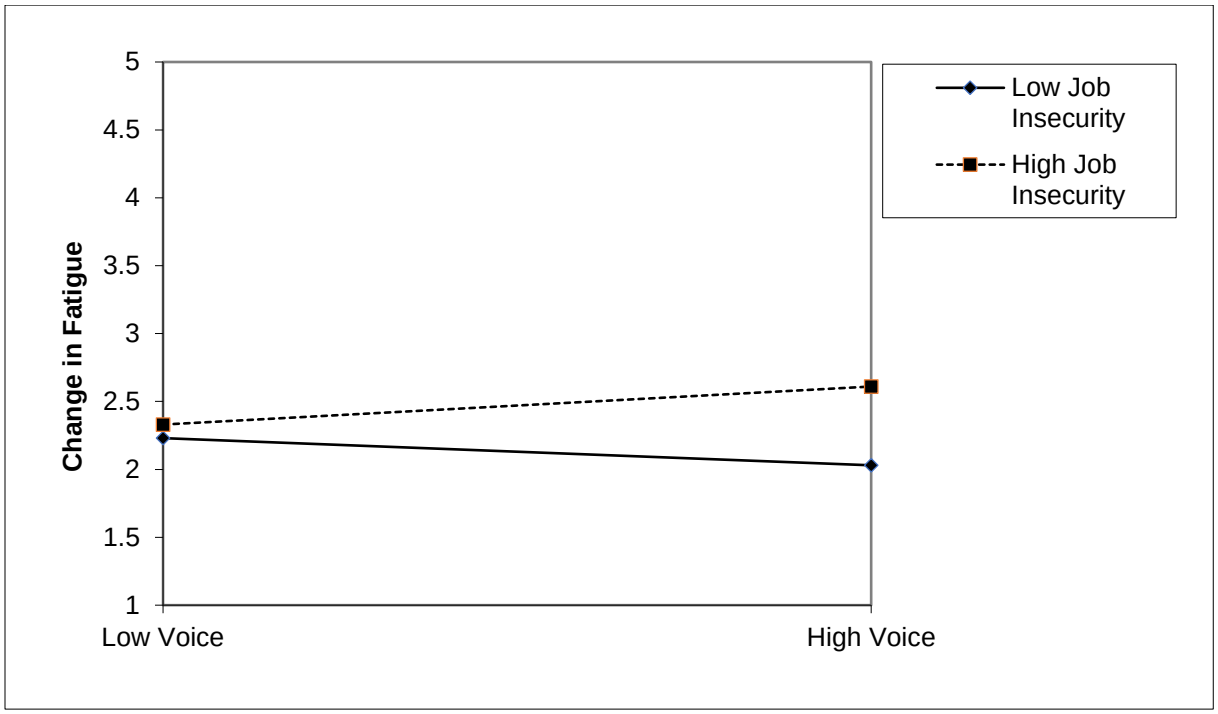


**Table 4**

*Results of Structural Equation Model without Interactions (Model 1), Hypothesised Structural Equation Model (Model 2), and Reverse Causal Structural Equation Model (Model 3)*

| | Model 1 | | Model 2 | | Model 3 |
|---|---|---|---|---|---|
| | ΔT1-T2 Vigour | ΔT1-T2 Fatigue | ΔT1-T2 Vigour | ΔT1-T2 Fatigue | ΔT1-T2 Voice |
| Predictor | Estimate (SE) | Estimate (SE) | Estimate (SE) | Estimate (SE) | Estimate (SE) |
| T1 Vigour | -.39 (.03)** | | -.40 (.03)** | | .03 (.04) |
| T1 Fatigue | | -.41 (.04)** | | -.42 (.04)** | -.01 (.04) |
| T1 Voice | .09 (.03)** | <.01 (.03) | .10 (.03)** | .02 (.03) | -.34 (.03)** |
| T1 Job insecurity | -.01 (.04) | .18 (.05)** | -.02 (.04) | .17 (.05)** | .06 (.04) |
| T1 Voice × T1 Job insecurity | | | .06 (.04) | .12 (.04)** | |
| T1 Job insecurity × T1 Vigour | | | | | .01 (.03) |
| T1 Job insecurity × T1 Fatigue | | | | | -.02 (.03) |
| $R^2$ | .20** | .17** | .20** | .20** | .19** |
| Log likelihood (df) | -25,559.671 (99) | | -25,552.221 (101) | | |

*Note.* Unstandardised coefficients are reported. T = Time; * $p < .05$; ** $p < .01$.

### Supplementary Results

The results of the reverse causal model (Table 4, Model 3) show that T1 vigour, fatigue, and job insecurity did not have main effects on change in voice over time, and their respective interactions also did not yield significant effects. As this model contains an additional outcome and, thus, is not nested within Models 1 and 2, we were not able to compare the fit of these models. We note, however, that the effects found in Model 2 remained significant when estimated simultaneously.

## Discussion

This study aimed to investigate whether employee voice enhances both vigour and fatigue as two important and antagonistic aspects of employee well-being. Additionally, we examined how job insecurity impacts the hypothesised relationships. While our findings support the assumption that voice predicts increases in vigour over time, voice did not have a main effect on increases in fatigue over time (i.e., using a time lag of three months). However, job insecurity moderated the effect of voice on changes in fatigue, such that voice increased fatigue when job insecurity was high and reduced fatigue when job insecurity was low. In contrast, we did not find the expected interaction effect of voice and job insecurity on vigour.

The pattern of direct effects suggests that our results yield further evidence for the energy-generating pathway of proactive work behaviours (Cangiano et al., 2018; Zacher et al., 2019). Yet, we found only conditional support for the resource-depleting pathway of proactivity: The negative effects of voice do not ensue per se; instead, voice seems to be primarily energising and enhancing well-being. A plausible explanation of this pattern lies in the mechanisms behind voice and silence as recently proposed by Sherf et al. (2020). Investigating differences between voice and silence, the conscious withholding of potentially important content (Morrison, 2011),

the researchers argue that voice and silence are independent constructs, being regulated, respectively, by the behavioural activation/inhibition system (BAS/BIS). Concerning the consequences of these behaviours, Sherf et al. (2020) show that the relationship between voice and burnout is weaker than the relationship between silence and burnout. Their line of reasoning is that frequent engagement in BIS, for example by being silent about concerns regarding the workplace, entails heightened anxiety and alertness (Carver & White, 1994). In contrast, engaging in voice is regulated by the BAS (Sherf et al., 2020), which has been found to be unrelated to strain (Johnson et al., 2012). Our results regarding a direct effect from voice on increases in vigour but not on increases in fatigue align with this argumentation.

Regarding the pattern of interaction effects, with a moderating effect of job insecurity on the effects of voice on fatigue but not on vigour, we assume that the energy-generating pathway is not (easily) affected by the perception of external conditions. This matches with the results of Cangiano et al. (2018), which suggest that the process of fulfilling the needs for competence and environmental mastery underlying the energy-generating pathway is relatively independent of context. The fulfilment of these needs might therefore directly lead to well-being. Recognising that the developmental pathways for vigour and fatigue differ (Kinnunen et al., 2014), and that we assume different underlying mechanisms for vigour and fatigue, respectively, it is plausible that only the resource-depleting pathway is affected by job insecurity. Even though a direct effect on fatigue was not supported in our study, resource depletion as predicted by COR theory ensues when experiencing job insecurity (Hobfoll, 1989). This matches the reasoning of Frese and Zapf (1988), which suggests that some processes between antecedents and outcomes only materialise when “switched on” by a moderator. This seems to be the case for the relationship between voice and fatigue; our results show that the individual perception of the employment

context is relevant and interacts with the effects of voice in predicting fatigue. They are also consistent with prior research examining punitive supervision and perceived organisational support as moderators of the relationship between proactive behaviour and well-being (Cangiano et al., 2018; Zacher et al., 2019).

Employees may perceive a heightened responsibility to voice when, at the same time, feeling more insecure in their jobs. This can increase feelings of fatigue (Detert & Edmondson, 2011; Knoll et al., 2016). In contrast, when job insecurity is low, people seem to be able to cope more successfully with the psychological risks that voice entails. This is in line with Cangiano et al. (2018), who could only demonstrate the resource-depleting pathway under conditions of a hindrance stressor. Further, the asymmetry regarding the interaction effects on vigour and fatigue could be attributed to the proposed asymmetry in the job demands-resources model (Bakker & Demerouti, 2007): Job demands are assumed to relate more strongly to strain than to well-being outcomes, while well-being is supposed to be more dependent on resources. Correspondingly, studies have reported weaker associations of job insecurity with vigour than with exhaustion (Cheng et al., 2014; Kinnunen et al., 2014).

Our additional analyses did not reveal reverse effects of vigour and fatigue on voice. This is incongruent with previous research revealing a positive effect of positive mood on proactive behaviour (Bindl et al., 2012) and of vigour on (intention to) voice (Carnevale et al., 2018; Schmitt et al., 2017). Possible explanations for the diverging findings may lie in different time lags (Schmitt et al., 2017), different proactivity constructs (Bindl et al., 2012), or not testing for reverse effects (Carnevale et al., 2018).

**Theoretical and Practical Implications**

Our main theoretical implications are threefold. First, we add to existing research suggesting that voice has important implications for the individual, beyond performance-related outcomes (Bolino et al., 2010). Specifically, our finding of a positive effect of voice on increases in vigour provides additional support for the energy-generating pathway of proactivity (Cangiano & Parker, 2016). We further advance the literature on proactive behaviour in general and voice specifically by showing that, consistent with other studies, the resource-depleting pathway is not unconditionally valid, but materialises depending on the perception of organisational boundary conditions (e.g., job insecurity, punitive supervision, low perceived organisational support). This specifies the metaphor of voice as a double-edged sword to the metaphor of a useful sword that mostly entails good for those who speak up, but that can be detrimental to employ under certain conditions. We also extend the dual-pathway model by showing how the individual perception of a meso-level factor shapes the effects of voice on well-being.

Second, our findings have implications for theorising on job insecurity. Our study demonstrates the benefits of integrating the literature on voice, which has focused on voice as an outcome, with the literature on job insecurity, a key employment-related condition under which employees engage in voice and that employees can hardly influence themselves. We show that job insecurity is a relevant boundary condition of the relationship between voice and fatigue, but not of the relationship between voice and vigour. The current models of job insecurity do not account for such dynamic relationships. They predominantly position job insecurity as an antecedent hindrance stressor and, if at all, consider voice only an outcome. Our results refine this view on job insecurity by suggesting that it can act as a moderator that may interfere with some underlying mechanisms.

Third, we show that voice impacts changes in well-being, but not vice versa. That is, voice leads to increases in vigour and, when job insecurity is low, to decreases in fatigue, whereas occupational well-being does not seem to enhance (or reduce) voice. This finding stands in contrast to previous theorising and research suggesting that activated positive affect is a key predictor of proactive behaviours such as voice (e.g., Bindl et al., 2012; Carnevale et al., 2018; Schmitt et al., 2017). The reasons for this dissent could be investigated in future research.

In terms of practical implications, our results suggest that voice mainly benefits employees in terms of well-being. Hence, organisations should create possibilities for speaking up at work while working toward conditions that enable individuals to experience job security. Furthermore, supervisors should not actively encourage or expect employees who are experiencing job insecurity to speak up. A practical example how voice can be promoted is "participatory organisational research," in which the perspectives of unheard organisational members are included in knowledge production to advance theory and concrete practical organisational changes (see Burns et al., 2014, for an example).

**Limitations and Future Research**

This study has a number of limitations that could be addressed in future research. First, we studied voice as a narrow phenomenon, focusing exclusively on voice as an individual behaviour (Barry & Wilkinson, 2016; Wilkinson et al., 2020). This has been criticised more than once as an isolated approach to the construct that does not take fundamental hierarchies into account (e.g., Wilkinson et al., 2020). Even though we think that our conclusions can be useful for other traditions of voice research, they are not altogether generalisable to other kinds of voice, such as voice through collective organisation (Barry & Wilkinson, 2016). The conceptual model by Mowbray et al. (2015) displays which kinds of antecedents, contents, and channels of

voice could be considered in future research to be able to account for the full picture of employee voice in organisations.

Second, and in line with the first aspect, our approach to voice is limited as it suggests a stable level of voice. However, even though voice is a feature of an individual, it is also episodic, in that it necessitates aspects employees want to speak up about as well as opportunities to act (Detert & Edmondson, 2011). Supervisors and colleagues can be disapproving (Frese & Fay, 2001). However, only little research has focused on reactions to voice behaviour and how the meaning of voice can change depending on context, including ensuing behaviour of significant others (see Ng & Feldman, 2012 for an exception, reflecting on meaning of voice). Future research should explicitly address these dynamic aspects of voice to more fully account for the complex phenomenon of voice. Research designs using multiple measurements or diary studies allow the examination of changes in voice and more rigorous tests of potential reverse effects of well-being on voice.

Third, we used a unidimensional measure of voice in our study. However, more recent research suggests that individual voice is a multidimensional construct (van Dyne et al., 2003) and can, for example, be differentiated into prohibitive and promotive voice (Chamberlin et al., 2017). Prohibitive voice has been depicted as riskier and as more likely eliciting negative responses from others (Chamberlin et al., 2017; Starzyk et al., 2018). This suggests that future research should explore whether prohibitive and promotive voice affect well-being distinctively.

Fourth, the average level of job insecurity was rather low in the current study ($M$ = 1.88 on a 5-point scale). Therefore, floor effects may have led to statistical biases (e.g., Austin & Brunner, 2003; McBee, 2010). We examined our models with a subsample of $N$ = 142 employees who reported relatively high levels of job insecurity (i.e., a score of 3 or higher on a

5-point scale). However, using this smaller subsample, the fit of the direct effects model (Model 1) was not satisfactory (i.e., CFI/TLI < .90, RMSEA > .08), and the models with interaction and reverse effects (Models 2 and 3) did not converge. Moreover, in the model with direct effects, we did not find significant effects of voice and job insecurity on changes in vigour or fatigue. Further related to the measurement, common method bias could also result from exclusively relying on self-report data (Podsakoff et al., 2003). However, to address the latter concern, we separated our predictor and outcome variables by a time lag of three months and controlled for baseline levels in the outcomes.

Fifth, even though we found partial support for the dual-pathway model, we still do not know enough about the underlying processes. Our model did not measure the proposed mediating mechanisms of basic need satisfaction and resource depletion, even though our hypotheses and interpretation rely on them. Models of voice and well-being need to account for several process variables to gain a realistic understanding of the phenomenon (Zacher et al., 2019). Future research should replicate our assumptions using an explicit moderated mediation model that measures the satisfaction of basic needs and resource depletion. Finally, drawing on the line of reasoning of Sherf et al. (2020), it would be very promising to investigate whether direct effects can be found for silence on fatigue but not on vigour.

**Conclusion**

The effects of employee voice on occupational well-being outcomes have been neglected. Our study found that speaking up at work can benefit employees by increasing vigour and, when job insecurity is low, by decreasing fatigue. However, voice can also lead to increases in fatigue when job insecurity is high. Organisations should create opportunities for speaking up while creating safe workplaces to prevent negative consequences of voice for employees.

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# Appendix

*Mplus syntax for combined latent difference score (LDS) and latent moderated structural (LMS) equation model (Model 2)*

*Note.* T = Time; vig = vigour; fat = fatigue; voi = voice; jobins = job insecurity. Syntax lines starting with "!" were added to test the alternative reverse causal model (Model 3).

```
ANALYSIS:
TYPE = GENERAL RANDOM;
ALGORITHM=INTEGRATION;
INTEGRATION =MONTECARLO;

MODEL:

T1vig BY
T1vig1@1
T1vig2(1)
T1vig3(2)
T1vig4(3)
T1vig5(4)
T1vig6(5);

T1fat BY
T1fat1@1
T1fat2(3)
T1fat3(4);

T1voi BY
T1voi1@
T1voi2(5)
T1voi3(6)
T1voi4(7)
T1voi5(8)
T1voi6(9);

T1jobins BY
T1jobins1
T1jobins2
T1jobins3
T1jobins4;

T2vig BY
T2vig1@1
T2vig2(1)
```

```
T2vig3(2)
T2vig4(3)
T2vig5(4)
T2vig6(5);

T2fat BY
T2fat3@1
T2fat3(3)
T2fat3(4);

!T2voi BY
!T2voi1@1
!T2voi2(5)
!T2voi3(6)
!T2voi4(7)
!T2voi5(8)
!T2voi6(9);

T1vig1*; T1vig2*; T1vig3*; T1vig4*; T1vig5*; T1vig6*;
T2vig1*; T2vig2*; T2vig3*; T2vig4*; T2vig5*; T2vig6*;

T1vig1 WITH T2vig1*;
T1vig2 WITH T2vig2*;
T1vig3 WITH T2vig3*;
T1vig4 WITH T2vig4*;
T1vig5 WITH T2vig5;
T1vig6 WITH T2vig6*;

T2vig ON T1vig @1;
vigdiff BY T2vig @1;
vigdiff ON T1vig*;

T1vig*; T2vig@0; vigdiff*;

T1fat1*; T1fat2*; T1fat3*;
T2fat1*; T2fat2*; T2fat3*;

T1fat1 WITH T2fat1*;
T1fat2 WITH T2fat2*;
T1fat3 WITH T2fat3*;

T2fat ON T1fat @1;
fatdiff BY T2fat @1;
fatdiff ON T1fat*;

T1fat*; T2fat@0; fatdiff*;
```

```
!T1voi1*; T1voi2*; T1voi3*; T1voi4*; T1voi5*; T1voi6*;
!T2voi1*; T2voi2*; T2voi3*; T2voi4*; T2voi5*; T2voi6*;

!T1voi1 WITH T2voi1*;
!T1voi2 WITH T2voi2*;
!T1voi3 WITH T2voi3*;
!T1voi4 WITH T2voi4*;
!T1voi5 WITH T2voi5*;
!T1voi6 WITH T2voi6*;

!T2voi ON T1voi @1;
!voidiff BY T2voi @1;
!voidiff ON T1voi*;

!T1voi*; T2voi@0; voidiff*;

inter1 | T1voi XWITH T1jobins;

!inter2 | T1vig XWITH T1jobins;
!inter3 | T1fat XWITH T1jobins;

vigdiff ON
T1voi
T1jobins
inter1;

fatdiff ON
T1voi (b1)
T1jobins (b2)
inter1 (b3);

!voidiff ON
!T1vig
!T1fat
!T1jobins
!inter2
!inter3;

MODEL CONSTRAINT:

NEW(LOW_W1 MED_W1 HIGH_W1 SIMP_LO1 SIMP_MED1 SIMP_HI1);
LOW_W1 = -1;
MED_W1 = 0;
HIGH_W1 = 1;
```

```
SIMP_LO1 = b1 + b3*LOW_W1;
SIMP_MED1 = b1 + b3*MED_W1;
SIMP_HI1 = b1 + b3*HIGH_W1;

OUTPUT:
STAND CINT;
```