Bridging the Gap: Measuring the Impact of Worker Voice on Job-related Outcomes[1]

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EXECUTIVE SUMMARY

The purpose of this study was to review the contemporary landscape of voice research and to empirically test a reliable measure of voice for use in future job quality surveys. We reviewed the literature on existing worker voice measures, conducted two different surveys with U.S. workers, and tested different voice measures to understand their associations with various job-related outcomes.

Our work develops a framework that captures important elements of voice, namely voice that captures both the interests of workers and employers. In this report we:

- Summarize the contemporary landscape of voice research in relation to job quality.
- Develop and test a reliable and conceptually valid measure of worker voice we call the voice gap measure (the gap in how much say a worker feels they ought to have and how much say they actually have) that is suitable for use in future job quality research.
- Provide exploratory analyses showing how our measure of voice gap is associated with job-related outcomes.

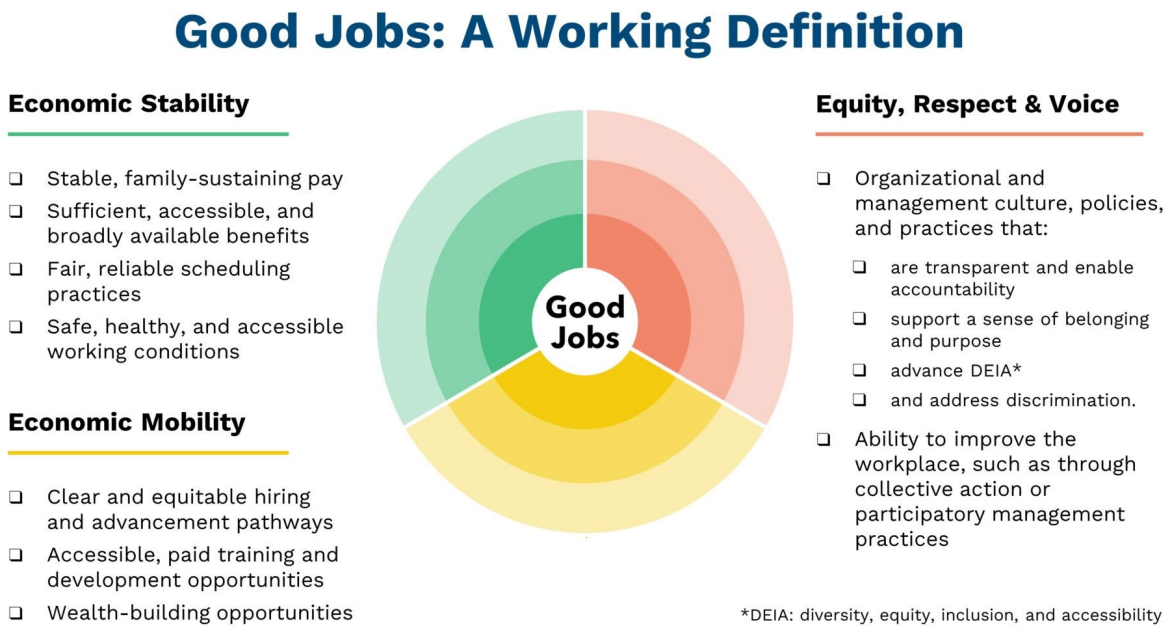
Our empirical findings reveal that:

- Out of several different voice measures, the voice gap measure meets rigorous standards for validity testing.
- Workers see a distinction between having voice gap on issues related to their own interests and the interests of their organization.
- Even after controlling for different elements of job quality, voice gap is still statistically associated with various job-related outcomes. Specifically, voice gap on workers issue is significantly associated with job-related outcomes, while voice gap on organizations' issues is not significantly associated with those outcomes.

Based on these results, we recommend that our measure of voice gap be used in future surveys to measure voice as one dimension of job quality. We also recommend further research aimed at developing a usable and reliable measure to measure the extent to which voice behaviors will result in a meaningful change at work (e.g., voice impact), which is another missing aspect of voice.

BACKGROUND

Figure 1. Good Jobs - A Working Definition



Source: Good Jobs Champions Group Statement on Good Jobs. Accessed at https://www.aspeninstitute.org/programs/good-jobs-champions-group/

The Families and Workers Fund, in collaboration with the U.S. Department of Labor, has enlisted a large group of researchers to develop a comprehensive set of indicators of job quality (Families and Workers Fund, 2022; Hertel-Fernandez et al., 2022). One goal of this collaborative effort is to develop a broad consensus on what features of work should be included in a definition of job quality and to track these features over time to assess the rate of progress (or lack thereof) in improving the quality of jobs available to all American workers.

Figure 1 summarizes the various facets of job quality identified by experts convened by the Families and Workers Fund and the Aspen Institute (The Aspen Institute, 2022). This definition is widely endorsed by experts from various fields related to work and employment studies, such as the sociology of work, organizational psychology, and industrial relations. It also highlights the substantial advancements researchers have made in pinpointing the diverse aspects of job quality and developing fine-grained measures for them.

It is worthwhile to note that these experts identify equity, respect, and voice as a key dimension of job quality. They define voice as the "ability to improve the workplace through collective action or participatory management practices." While several thinktanks such as the Brookings Institute (Kinder, 2019) have included these elements in their conceptual frameworks for job quality research, there is no validated measure of worker voice building on these insights.

Therefore, the main objectives of this report are:

- To understand the contemporary landscape of voice research in relation to job quality.
- To empirically test a reliable and valid measure of worker voice suitable for use in future job quality research.
- To analyze how worker voice is associated with job-related outcomes.

THE LANDSCAPE OF WORKER VOICE SCHOLARSHIP

The concept of worker voice is an interdisciplinary subject, spanning industrial relations (IR) and organizational behavior (OB) scholarship. We reviewed approximately 90 journal articles primarily sourced from leading journals in the fields of organizational behavior (OB) (e.g., *Academy of Management Journal*) and industrial relations (IR) journals (e.g., *ILR Review*). These articles, published over the last two decades, offer a plethora of perspectives on worker voice. We found that a definition that synthesizes both traditions proposes that worker voice encompasses workers' effort to influence organizational decisions affecting their job rewards, experiences, and practices in a broader sense (Wilkinson, Dundon, Donaghey & Freeman, 2020:5).

Our review highlights two main divergences in the IR and OB scholarship regarding worker voice. First, there is a difference in the mechanisms of voice enactment. IR scholarship highlights various channels through which workers can express their concerns. Unions play a critical role in negotiating with management and protecting workers from retaliation for voicing their concerns (Webb & Webb, 1897). However, new channels like dispute resolution procedures and problem-solving teams have emerged following the decline of unionization (Kochan, Katz & McKersie 1986; Appelbaum et al. 2011; Dobbin & Kelly, 2007; Avgar, 2021). On the other hand, OB research views voice as an individual, discretionary action aimed at improving organizational performance. Van Dyne and LePine (1998: 109), for example, describe voice as a worker's extra-role behavior, involving innovative suggestions for change and recommending modifications to standard procedures, even when others disagree.

Moreover, a critical distinction arises in the types of issues workers voice—those related to their own interests, such as compensation and working conditions, versus those related to organizational interests, such as firm performance. This distinction reflects the siloed nature of IR and OB scholarship. The IR perspective acknowledges the possibility of both conflicting and mutual interests between workers and organizations (Commons,1932; Budd 2004; Kochan et al., 2019; Doellgast, Bidwell & Colvin, 2021) Conversely, the OB perspective tends to view voice as prosocial behavior primarily aimed at benefiting the organization (Organ, Podsakoff & MacKenzie, 2006; Van Dyne, Ang & Botero 2003: 1370-1371). This perspective suggests that voice acts primarily in the service of organizational, rather than individual worker interests.[2]

Our report seeks to bridge this divide, advocating for an integrated approach that considers both the structures and the expression of worker voice. By doing so, we aim to capture the mutual, but

[2] See Detert & Burris (2007) and Morrison & Milliken (2000) for similar definitions.

also conflicting interests between workers and organizations, providing a holistic understanding that captures the full spectrum of worker voice.

WORKER VOICE AND JOB-RELATED OUTCOMES

We also explored various frameworks for assessing worker well-being and other job-related outcomes, such as job satisfaction and how it relates to worker voice. Worker voice is often assessed based on the presence of unions, collective bargaining agreements (CBAs), or works councils (Gammarano, 2020). However, the significance of worker voice as an important component of "job quality" has been increasingly recognized by various think tanks and organizations (The Aspen Institute, 2022; The Families & Workers Fund, 2022; U.S. Department of Commerce, 2022). We concur with this perspective, positing that the presence of worker voice is an essential aspect of what defines a "good job." Enhancing worker voice, therefore, could potentially lead to improvements in the broader spectrum of benefits that are typically associated with high-quality employment.

Interestingly, our review also revealed that the impact of worker voice on job-related outcomes, including employee well-being, is varied, with research showing both beneficial and detrimental effects. On one hand, worker voice can enhance employee wellbeing by providing a means to express concerns and influence workplace practices thereby resulting in meaningful changes (Schaufeli and Bakker, 2004). Moreover, voice has the potential to improve workers' sense of control over work demands and ameliorate their stress and burnout (Karasek, 1979; O'Brady and Doellgast, 2021). In this regard, losing the opportunity to voice may be seen as a lack of resources at work, which in turn may lead to exhaustion, lower job satisfaction, and higher intention to quit (Kerrissey et al., 2022).

Research also notes that the exercise of voice is not without its downsides. Voice requires workers to make extra effort to change the status quo and can be physically and also emotionally draining, creating extra pressure on workers' existing work demands (Sherf et al., 2021; Shipton et al., 2023). Speaking up often involves psychological risk; making suggestions may be opposed by others, including their coworkers, and may not always be seen as relevant and appropriate (Röllmann et al., 2021). Furthermore, when workers take on extra tasks on behalf of organizations without paying attention to their own needs, it may diminish their sense of well-being and contribute to burnout experiences (Demerouti et al. 2001; Shipton et al. 2023).

The mixed findings regarding the influence of worker voice on employee well-being and job-related outcomes could arise from a fundamental issue: an incomplete understanding of worker voice. Traditional measures, such as the presence of a union or works council, may not fully reflect diverse aspects of voice. Evaluating worker voice should go beyond simply noting if voice opportunities exist to critically assessing their quality and effectiveness, acknowledging the growing recognition of worker voice as an integral element of job quality. The gap between expectations and actual experiences of voicing concerns can significantly shape the perceived value of worker voice, and in turn, how they view their jobs. Consequently, there is a need for more refined measurement tools that accurately capture the essence and impact of voice

channels. Improved measurement methods will enhance our understanding of the relationship between worker voice and job outcomes.

To address this, we introduce the concept of "voice gap" (Kochan et al., 2019), which measures the difference between how much voice workers believe they ought to have and how much voice they actually have. A worker's experience of voice must be explicitly linked with one's perception of having as much say as one ought to have, which is important in a worker's perception of voice channels but also quality job (Muñoz de Bustillo et al., 2011). Measuring the voice channel alone provides an incomplete picture as it does not address the effectiveness or quality of these channels. Introducing a notion of voice gap can provides a holistic and direct insight into the workers' experiences, capturing their perceived potential, or lack thereof, to influence and shape their workplace. This concept not only bridges the gap between IR and OB perspectives but also establishes a solid framework for assessing variations in workers' influence at work and their implications on worker well-being and other important job-related outcomes.

DATA AND METHODS

Data Collection and Sample Characteristics

Our study investigates the 'voice gap' and its effects on employee well-being and job-related outcomes. In 2022, we gathered a nationally representative sample using Prolific, an online platform widely used for recruiting research participants in the social sciences. Our respondents, all 18 years or older, currently employed for wages, and not in upper management or ownership roles, numbered 704 adults surveyed from September 14th to September 16th, 2022. This initial survey served as an exploratory analysis to understand different measurements of voice and their association with job-related outcomes.

It is worthwhile to mention that in this pilot survey, we also introduced another new metric called 'voice impact,' alongside the voice gap measures. This measure was designed to capture how employees perceive the impact of speaking up—whether individually or collectively—on achieving their desired outcomes within the organization. Our intention with voice impact was to provide a complete understanding of how worker voice functions in an organizational context, also distinguishing between individual actions (like a worker speaking up alone) and collective actions (such as a group of coworkers raising an issue together). We found that workers demonstrated a clear understanding of the differences between their own interests and those of their organizations in both voice impact and voice gap measures. However, when it came to the voice impact measure, which aimed to differentiate between the individual and collective forms of voice expression, workers did not make as clear a distinction.

Building on these insights, we conducted a second survey designed to refine our measures of voice impact and voice gap while including more robust job quality controls.[3] We again recruited a national representative sample through Prolific, resulting in 1185 adults surveyed from June 14th to June 27th, 2023. Our findings indicated that although our voice impact measure still significantly related to worker well-being and job-related outcomes, it was the voice gap measure

[3] For reference, Appendix A contains the details of our voice impact measure.

that had a stronger relationship with these variables. Also, the voice impact measures failed to meet the criteria for discriminant validity.[4] Therefore, we will focus primarily on the voice gap measure, and the results from this report concern this second survey.

Table 1. Sample Characteristics: The Comparison between CPS Annual Social and Economic Supplement (ASEC) versus Prolific Worker Voice Survey (WVS)

	CPS ASEC (2023)		Prolific Survey (2023)
Variable	(%)		(%)
Gender			
Female	47	Female	51
Male	53	Male	47
		Transgender/Non-binary	2
Age			
18—34	34		31
35—49	33		28
50—64	27		33
65 plus	7		8
Race			
White	77		80
Black	13		11
Asian, and Pacific Islanders	8		6
Other and 2+	3		3
Ethnicity			
Hispanic	19		5
Marital Status			
Married	54		44
Widowed	1		2
Divorced	11		14
Never married	33		40
Education Level			
High School or less	32		12
Some college	15		27
College	37		42
Advanced	16		18
Full-time employment status	85		70
Earning (before taxes)			
Less than $30000	21		31
$30000-$50000	24		22
$50000-$75000	22		23
Greater than $75000	33		24

[4] For the standard definition of discriminant validity, see Appendix C.

Hours worked per week		
1 ~ 10	2	3
11 ~ 20	6	9
21 ~ 34	8	14
35 ~ 40	65	52
41 ~ 50	13	18
50 +	7	3
Union membership	11	12
Industry		
Agriculture, forestry, fishing, and hunting	2	1
Mining, quarrying, and oil and gas extraction	1	0
Construction	7	5
Manufacturing	10	6
Wholesale and retail trade	12	12
Transportation, warehousing and utilities	6	3
Information	2	11
Finance and insurance, and real estate and rental and leasing	7	7
Professional, scientific, management and administrative, and waste management services	12	14
Educational services, and health care and social assistance	24	21
Arts, entertainment, recreation and accommodation, and food services	8	6
Other services, except public administration	5	10
Public administration	6	3
N	63,307	1,185

Note. For each data set, the sample is restricted to those workers aged 18+ who are employed and working for pay.
Descriptive statistics for the CPS ASEC use weighted data.
For the CPS ASEC, earning reflects any wage or salary income and is not necessarily limited to one's primary job. In Prolific Surveys, earning reflects earnings from primary/current job, before taxes.
The union question is asked of only a subset of CPS ASEC respondents (n=9,367)

Our analysis confirms that the sample from our study is a close reflection of the U.S. working population. Table 1 reports the individual demographic and socio-economic characteristics of our sample with comparisons to the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) in 2023 (U.S. Census Bureau, 2023). In terms of demographic, socio-

economic attributes, such as gender, age, and marital status, as well as industry composition, our sample closely mirrors the CPS ASEC sample. However, although there is no notable discrepancy when it comes to racial composition, it appears that the Hispanic population is relatively underrepresented in our dataset. Educational backgrounds also differ; our sample has a lower percentage of respondents with a high school degree, but a higher proportion of those with a college degree or some college education, compared to the CPS ASEC sample.

Additionally, our sample excludes senior managers, owners, or family members of owners, resulting in a greater proportion of low-income workers relative to the national workforce. However, our sample still closely matches the CPS ASEC figures in terms of the average number of hours worked per week and the presence of union representation. This demographic and socio-economic congruence supports the representativeness of our findings in the broader context of the U.S. labor market.

Voice Gap

As discussed above, our report focuses on the voice gap. We asked survey participants a question to gauge the voice gap: 'At your primary job, how much of a say or influence do you have on the following issues?' To address the different dimensions of the voice gap, we constructed two sets of questions. The first set targets issues related to workers' interests, namely, compensation, working conditions, and respect. The second set addresses issues tied to employers' interests, namely, improving the quality of the organization's products and services, the strategy of the organization, and ways to improve the reputation of the organization. Respondents indicated their level of influence on these issues using a scale from 1 (as much as I ought to have) to 5 (none). We reverse-coded the responses so that higher scores indicate a larger voice gap. For reference, Appendix B contains the details of our voice gap measure.

Discriminant Validity of Voice Gap

In our research, we have developed measures specifically designed to capture distinct facets of workers' and organizations' interests. Our objective extends beyond distinguishing these measures conceptually; we aim to empirically demonstrate that workers themselves perceive the distinctiveness of these dimensions. This process is important in establishing discriminant validity, which in social science research, serves to confirm that the constructs we are measuring are not only theoretically unique but also statistically separable.

To test our hypothesis regarding their distinctiveness, we utilized factor analysis—a statistical method that identifies latent variables representing constructs that are not directly observable. Specifically, we implemented Confirmatory Factor Analysis (CFA), which contrasts with exploratory factor analysis by requiring an a priori hypothesis about the number of factors and their associated indicators. We posit that there are two distinct dimensions of interest: one for workers and the other for organizations. By setting the number of factors to two in our CFA model, we sought to confirm that workers indeed make a clear distinction between issues related to their own interests and those of their organizations.

Figure 2. Factor analysis result

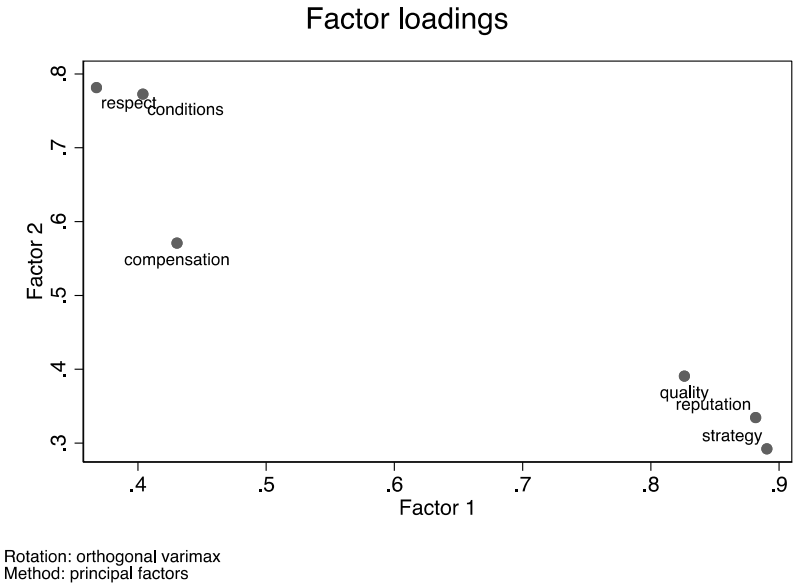


Figure 2 displays the factor loadings, which serve as a visual representation of how different indicators of voice gap correlate with each other based on workers' interests or organizations' interests. The first factor has strong loadings on aspects such as improving the quality of the organization's product and service, improving the reputation of the organization, and the strategy of the organization. Given that these facets are associated with wider organizational goals, this dimension can be labeled as the voice gap pertaining to the organization's interests. The second factor prominently loads on attributes like respect, working conditions, and, to a slightly lesser degree, compensation. This can be described as the voice gap associated with workers' interests. These two factors are orthogonal, meaning they are independent and not correlated with each other. Our results from the factor analysis demonstrated that workers do distinguish between issues related to their own interests and issues related to their employer's interests. Therefore, we created two variables – voice gap (worker) and voice gap (organization) – which will be included in our regression models.

Following our initial test, we proceeded to examine the degree to which our voice gap measures could be differentiated from other constructs that are closely related. While there is an array of indicators representing worker voice, we decided to include "voice behavior" measures (Liang et al. 2012), which have been frequently used in previous research. In their framework, Liang et al. (2012) distinguish between promotive and prohibitive voice where promotive voice is defined as workers' expression of suggestions for improving the organization, while prohibitive voice is defined as workers' expressions of concerns about workplace practices. Each dimension is measured with three indicators. A sample item includes, "I proactively give suggestions for issues that may influence the work I do" for promotive voice and "I pointed out problems when they appeared at my job, even if that would hamper relationships with other colleagues" for prohibitive voice. Responses range from 1 (strongly disagree) to 5 (strongly agree).

Table 2. Correlations of all Voice Measures

	(1)	(2)	(3)	(4)
(1) Promotive voice	1			
(2) Prohibitive voice	0.72	1		
(3) Voice Gap (worker)	-0.40	-0.36	1	
(4) Voice Gap (organization)	-0.40	-0.38	0.63	1

Note. All correlation coefficients are significant at the 0.05 level.

Results reported in Table 2 suggest that our measures of voice gap demonstrate discriminant validity when compared with measures of voice behavior. Specifically, the correlation between promotive and prohibitive voice behaviors is.72, suggesting that these constructs are closely related. Likewise, the correlation between voice gap (worker) and voice gap (organization) is also strong at .63. However, the correlations between the two dimensions of voice behavior and the two dimensions of voice gap are lower (all absolute values are below .5), implying that these constructs, while related, are not identical. These modest correlations indicate that voice gap measures are distinct from those captured by measures of actual voice behavior. These findings align with our expectations, indicating that our measure of voice gap captures workers' perceptions and experiences, rather than their actual behaviors. Appendix C provides the technical details of a more formal test for the reliability and validity of our voice gap measures.

Job-related Outcomes

We tested the effect of voice gap on job-related outcomes while accounting for various job quality controls. Job satisfaction was measured with the single question, "All things considered, how satisfied are you with your primary job?" Responses were captured on a 7-point scale, varying from 1 (completely dissatisfied) to 7 (completely satisfied). For well-being, we employed the WHO-5 well-being questionnaire, consisting of five self-rated items measured on a 6-point Likert scale (Topp et al, 2015). Higher scores on this scale indicate better well-being. An example item from this questionnaire is, "I have felt cheerful in good spirits," with response options ranging from 0 (at no time) to 5 (all the time). The raw score therefore theoretically ranges from 0 (absence of well-being) to 25 (maximal well-being). Burnout was measured through a single item where respondents classified their burnout level according to their own definition of burnout. Responses ranged from 1 ("I enjoy my work. I have no symptoms of burnout") to 5 ("I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes or may need to seek some sort of help") (Dolan et al., 2015). We also included turnover intention, which was measured with a single item asking about the likelihood of the respondent actively seeking new employment within the next year. Responses to this item ranged from 1 (not at all likely) to 3 (very likely).

Empirical Strategy

To assess the association of our voice gap measures with various job-related outcomes, we conducted a series of analyses utilizing ordinary least squares (OLS) regressions. As noted above, our dependent variables in these analyses included job satisfaction, well-being, burnout,

and turnover intentions. We controlled for demographic and socioeconomic characteristics (gender, age, race, ethnicity, marital status, education level, employment status, tenure, hours worked per week, union member, establishment size) and other dimensions of job quality: earnings from primary job, the number of benefits, schedule unpredictability, job insecurity, career advancement opportunities, job training, schedule freedom, work type (remote, hybrid, onsite fully), job autonomy, skill utilization, task variety, job intensity, job safety and discrimination. In all of our models, predictor variables have been standardized so that we can easily interpret and compare the magnitude of regression coefficients across the variables.

FINDINGS: VOICE GAP AND JOB-RELATED OUTCOMES

Figures 3. Plots of Coefficients of Voice Gap on Job-related Outcomes

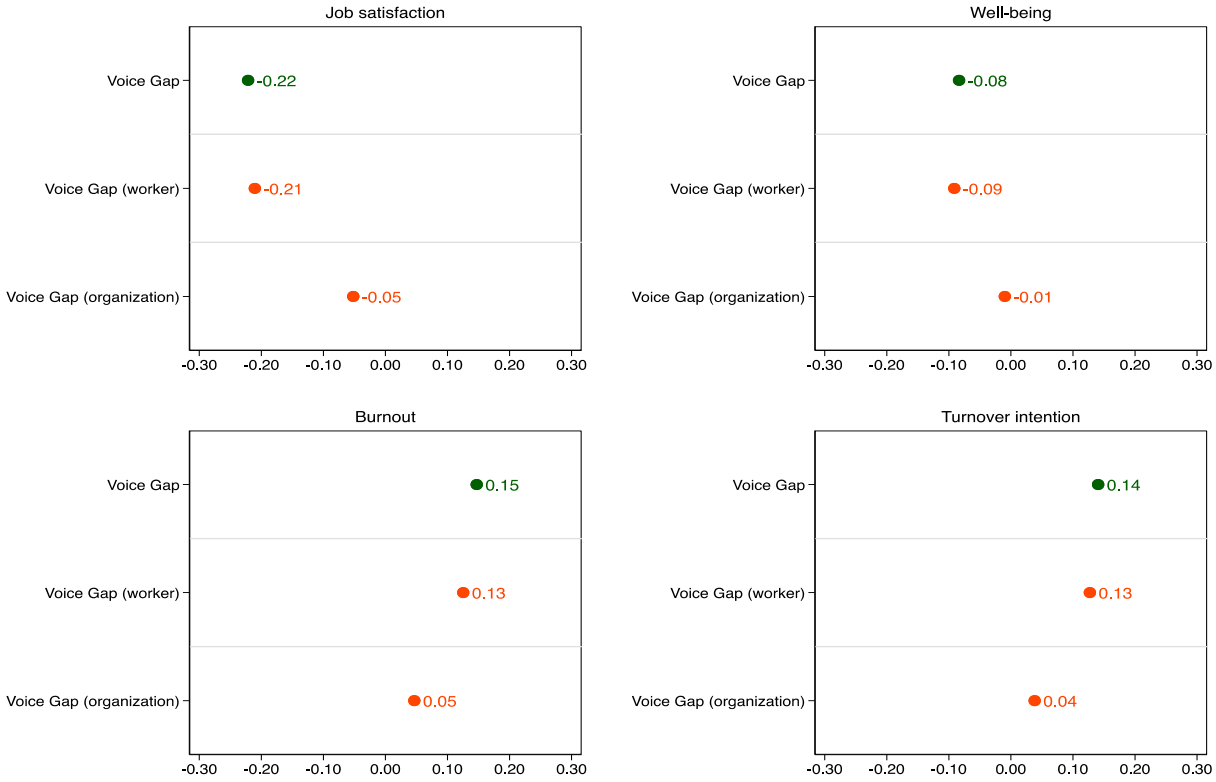


Figure 3 displays plots of coefficients corresponding to the outcome variable of interest (see Appendix D for more detailed results).

- Job satisfaction (upper-left quadrant): there is a clear inverse relationship between the voice gap and job satisfaction. A one standard deviation increase in the voice gap results in a significant 0.22 standard deviation decrease in job satisfaction ($p<0.001$). The data differentiates between the voice gap related to workers' own interests and that related to organizational interests. The negative effect on job satisfaction is more pronounced for

the voice gap associated with workers' interests; Specifically, one standard deviation increase in the voice gap (worker) is associated with a 0.21 standard deviation in job satisfaction ($p<0.001$). By contrast, one standard deviation increase in the voice gap (organization) is associated with a 0.05 standard deviation in job satisfaction ($p<0.1$).

- Well-being (upper-right quadrant): the voice gap also correlates negatively with employee well-being, primarily when it concerns workers' interests. A one standard deviation increase in the voice gap (worker) leads to a 0.09 standard deviation reduction in well-being ($p<0.05$), whereas the voice gap (organization) shows a negligible and statistically insignificant effect.
- Burnout (lower-left quadrant): there is a positive correlation between the voice gap and burnout, especially when linked to workers' interests. The analysis shows that a one standard deviation increase in the voice gap (worker) is associated with a 0.15 standard deviation increase in burnout ($p<0.001$). The voice gap (organization) has a smaller and less significant effect, increasing burnout by only 0.05 standard deviations ($p<0.1$).
- Turnover intentions (lower-right quadrant): the voice gap is positively associated with employees' intentions to leave their jobs. This trend is more evident with the voice gap related to workers' interests, with a one standard deviation increase resulting in a 0.12 standard deviation increase in turnover intentions ($p<0.001$). The voice gap (organization) has a smaller and statistically insignificant impact on turnover intentions, increasing them by only 0.04 standard deviations.

In summary, our analyses provide a comprehensive overview of the impacts of workers' perception of voice gap on various job-related outcomes. The results clearly show an inverse relationship between voice gaps and job satisfaction, with a more pronounced effect observed when the gap pertains to workers' own interests as opposed to the interests of their employers. This pattern remains consistent across other metrics of job-related outcomes, including overall well-being, experiences of burnout, and turnover intentions. Particularly noteworthy is the stronger impact of the voice gap (worker) across all these domains, which underscores the importance of addressing workers' expectations in voicing and addressing issues that matter most to them.

CONCLUSIONS AND RECOMMENDATIONS

The aim of this research was to develop a reliable and valid measure worker voice as an aspect of job quality and to assess its relationship to a set of job-related outcomes. Our results reveal that workers make a distinction between their own interests and those of their employers, and experiencing a gap in expressing their concerns are associated with reduced job satisfaction, diminished well-being, increased levels of burnout, and a higher intention to leave their jobs. Our results demonstrate that the voice gap measure is a consistent, reliable, and valid tool for evaluating the quality of employment.

As a result of our findings we **strongly recommend integrating measures of voice gap which account for both worker and employer interests in future job quality surveys to ensure a comprehensive evaluation of job quality**. Given the variation of influence workers desire for different sets of issues, scholars and policymakers might tailor the issues presented in the voice

gap measure for different industry, occupation, and organizational needs. For example, the ongoing staffing crisis in the healthcare sector can be attributed to prevailing perceptions of a toxic culture within the industry (Sull & Sull, 2023). By incorporating issues relevant to organizational culture in the voice gap measure, in addition to existing metrics related to compensation and working conditions, research may be able to capture a more nuanced understanding of workers' perceptions of job quality in this industry.

In our preliminary and main reports, we detail our attempts to experiment with developing a measure of "voice impact" that included a series of items aimed at capturing the perceived effects of speaking up in efforts to achieve change on issues of interest to workers and employers. While these voice impact measures failed to meet the technical standards for discriminant validity and were not as strongly related to job outcomes as our measure of voice gap, we recommend further work to refine and develop this alternative approach to measuring worker voice. If reliable and valid measures that aim to capture missing aspects of worker voice can be developed (such as voice impact), they could serve as useful and complementary measures of worker voice.

APPENDICES

Appendix A. Voice impact measure

To what extent do you agree or disagree that you alone can achieve <u>meaningful change</u> by speaking up to management about issues listed below?

	Strongly Disagree (1)	Disagree (2)	Neither Agree or Disagree (3)	Agree (4)	Strongly Agree (5)
Feeling disrespected					
My working conditions					
My pay and benefits					
Improving the quality of the organization's products and services					
The strategy of the organization (e.g. market position, business model, investments)					
Ways to improve the reputation of the organization					

To what extent do you agree or disagree that you and your coworkers together can achieve <u>meaningful change</u> by speaking up to management about issues listed below?

	Strongly Disagree (1)	Disagree (2)	Neither Agree or Disagree (3)	Agree (4)	Strongly Agree (5)
Feeling disrespected					
Our working conditions					
Our pay and benefits					
Improving the quality of the organization's					

products and services					
The strategy of the organization (e.g. market position, business model, investments)					
Ways to improve the reputation of the organization					

Appendix B. Voice gap measure

At your primary job, how much of a say or influence do you have on the following issues?

	As much as I ought to have (1)	**Somewhat less than I ought to have (2)**	**Less than I ought to have (3)**	**Much less than I ought to have (4)**	**None (5)**
My compensation					
Respect					
My working conditions					
Improving the quality of the organization's products and services					
The strategy of the organization (e.g. market position, business model, investments)					
Ways to improve the reputation of the organization					

Appendix C. Technical note on reliability and validity of the "voice gap" measures

1. Reliability of voice gap measures

We first investigate the reliability of the voice gap measure. Reliability refers to the consistency of a measure, ensuring that the scores obtained are minimally affected by random errors (Schwab 2005: 32). To ascertain the internal consistency of our measures we employed Cronbach's alpha – a widely recognized and utilized reliability coefficient. The Cronbach's alpha for the overall voice gap index is .89. The Cronbach's alpha for the items combined to form the workers' voice gap index is .80. The Cronbach's alpha for the items combined to form the employer's voice gap is .93. All three of these exceed the standard level of .60 or higher needed to meet the internal consistency of an index and thus indicate they meet the standard of reliability expected for use in the analysis.

2. Validity of voice gap measures

We turn our attention to validity to ensure that our voice gap indicators truly reflect the constructs they are intended to measure. Schwab (2005: 32-3) distinguishes primarily between convergent validity, which demands a high correspondence between scores from two or more different measures of the same construct, and discriminant validity, which requires low inter-correlations between measures intended for different constructs.

We first demonstrate that all the voice gap indicators included in our measures correlate to an extent and thus collectively demonstrate a significant degree of convergence. This serves as initial evidence that the indicators included are not arbitrary but share a common thread. To more formally test for convergent validity, we employed the Fornell and Larcker (1981) criterion using the Average Variance Extracted (AVE) method. For construct (i.e., latent variable) X, AVE is defined as follows:

$$AVE(X) = \frac{\sum_{i=1}^{p} \lambda_i^2}{\sum_{i=1}^{p} \lambda_i^2 + \sum_{i=1}^{p} Var(\varepsilon_i)} = \frac{1}{p}\left(\sum_{i=1}^{p} \lambda_i^2\right) \qquad (1)$$

where p is the number of indicators of construct X, and λ_i is the standardized factor loading of the i^{th} indicator (both indicators and the construct are standardized). Thus, for construct X, the value of AVE is equivalent to the average of the square of standardized factor loadings across all its indicators. Typically, an AVE value above 0.5 indicates an acceptable level of convergent validity, denoting that the latent construct accounts for over 50% of the variance in its indicators (Fornell & Larcker, 1981: 46; see also Cheung et al 2023).

Note that we hypothesized that voice gap is multi-dimensional. While all the indicators we use aim to measure the voice gap, they must also capture specific aspects of it. In other words, while our indicators are designed to capture the overarching construct of voice gap, they also tap into particular dimensions of this construct. We identified two significant dimensions in voice gap: workers' interest and organizational interest; the results of the two-factor Confirmatory Factor

Analysis (CFA) presented in the text support treating worker and employer interests as distinctive dimensions of the overall voice gap construct. It is important to demonstrate that these are not only reflections of the voice gap but are distinct areas that contribute to its multi-dimensional nature.

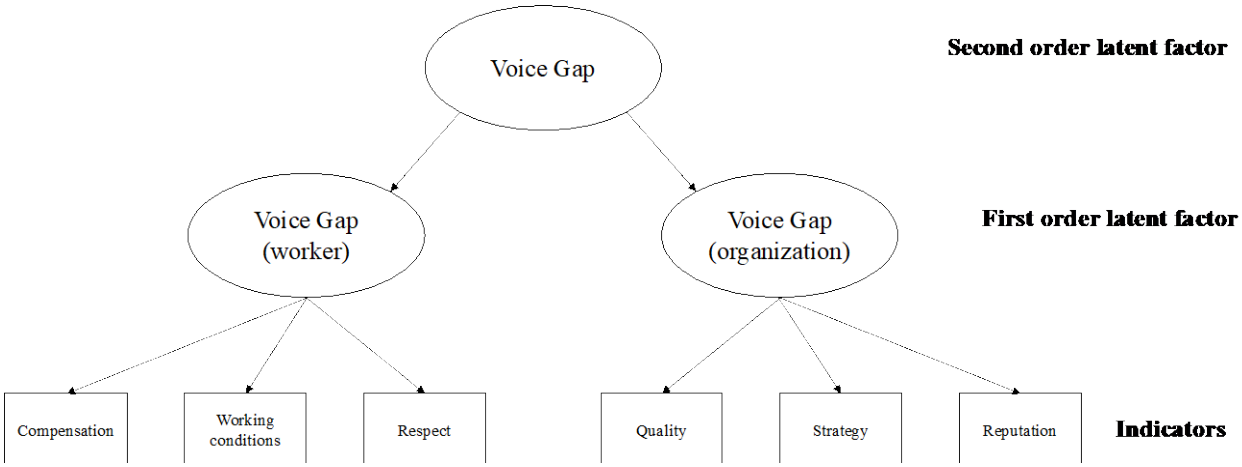


Figure A. Hierarchical structure of latent factors and indicators

The hierarchical nature of multi-dimensional constructs is illustrated in Figure A. In Figure A, the voice gap serves as a second-order latent factor. This means the voice gap is an underlying, overarching construct inferred from observed indicators, in this case, the specific dimensions of workers' interest and organizational interest and their indicators. At the same time, these specific dimensions function as first-order latent factors which are distinct from each other. In our context, if we calculated the AVE of the voice gap using only Eq. (1), we would treat the voice gap as if it were a unidimensional construct with a set of indicators reflecting virtually the same dimension. This approach does not fully capture the multi-dimensional nature of the voice gap.

Building on the Fornell & Larcker (1981) criterion, Credé & Harms (2015) provide a formula to calculate the AVE for a second-order factor, accounting for the hierarchical structure of multi-dimensional constructs. This formula takes into account the number of indicators (p), as well as the number of first-order factors (m). The formula is as follows:

$$AVE_{second-order} = \frac{1}{p}\sum_{j=1}^{m}\sum_{i=1}^{k}(\lambda_{ij}\gamma_j)^2 \qquad (2)$$

where k represents the number of indicators associated with each first-order factor and $(\lambda_{ij}\gamma_j)^2$ represents the variance of the i^{th} indicator extracted by the second-order factor. In our study a single second-order factor, the voice gap, is used to account for the covariation among voice gap (worker) and voice gap (organization) (i.e., the first-order factor) and their respective indicators.

Credé and Harms (2015; 854) also suggest a general guideline that the AVE for each first-order factor (AVE in Eq. 1) be at least .49 and the $AVE_{second-order}$ (in Eq. 2) be at least .24 as evidence of convergent validity of multi-dimensional constructs.

We find that the AVE for voice gap (worker) (.61) and voice gap (organization) (.81) factors both exceed the recommended threshold of .49. Furthermore, $AVE_{second-order}$ is .58, which is significantly higher than the threshold of 0.24 and indicating a satisfactory level of convergent validity. This statistical evidence shows that while our indicators collectively measure the 'voice gap' construct, the dimensions of workers' interest and organizational interest remain distinct and well-differentiated.

Lastly, we assess the discriminant validity of our voice gap measure by contrasting it with established voice metrics from prior research. We implement "voice behavior" measures used in prior studies (Liang et al. 2012). Note that voice behavior measures are also multi-dimensional as in the case of our voice gap measures. Liang et al (2012) distinguish between promotive and prohibitive voice where promotive voice is defined as workers' expression of suggestions for improving the organization, while prohibitive voice is defined as workers' expressions of concerns about workplace practices. Each dimension is measured with three indicators. A sample item includes, "I proactively give suggestions for issues that may influence the work I do" for promotive voice and "I pointed out problems when they appeared at my job, even if that would hamper relationships with other colleagues" for prohibitive voice. Responses range from 1 (strongly disagree) to 5 (strongly agree).

Following the procedure utilized for the voice gap measures, we first assess the convergent validity of the voice behavior construct. We first examine the AVE values for the sub-dimensions within voice behavior: promotive and prohibitive voice (i.e., the first order factors of the voice behavior). The AVE value of promotive voice and prohibitive voice are .61 and .64, respectively, both of which are higher than the recommended threshold of .49 at the dimension level. Simultaneously, the $AVE_{second-order}$ is .63, higher than the .24 threshold, meaning that the indicators of the voice behavior have a substantial common variance (i.e., a robust convergent validity). Altogether, this finding shows that while voice behavior indicators collectively measure the same construct, each sub-dimension is also well captured by its respective indicators.

Following this, we establish discriminant validity between the measures of the voice gap and voice behavior constructs. The Fornell and Larcker (1981) criterion suggests that in order to establish discriminant validity between two or more different constructs, respective AVE values of measures should be higher than their squared variance (SV), often referred to as AVE-SV approach (Grewal et al. 2004). In our analysis, we employ a model incorporating two aggregated indicators, representing the voice gap and the voice behavior respectively, based on the premise above that they are both multi-dimensional, second-order constructs. We find that AVE values of .58 for voice gap and .64 for voice behavior, while the squared variance between the two constructs is .22. The fact that both AVE values are substantially higher than the SV value demonstrates the distinctness of the measures of the voice gap from the voice behavior construct, thereby establishing discriminant validity.

It is important to mention that the AVE values slightly changed in this combined model; specifically, the AVE for the voice gap adjusted from .63 to .58, while the AVE for the voice behavior construct shifted from .63 to .64. These differences can be attributed to the AVE's sensitivity to the particular set of indicators incorporated into the computation, which in this case, includes a total of 12 indicators (6 for the voice gap, and 6 for the voice behavior) along with their associated error variances. This extension of the model influenced the AVE calculations, resulting in the observed adjustment. However, a minor change in the AVE values should not be misconstrued as a flaw in the operationalization of constructs. Rather, it shows the relative nature of the AVE, indicating AVE values are often dependent on the number of total indicators included in its calculation. Therefore, a minimal change in AVE values that does not cross below the threshold of acceptability does not undermine the validity of the measure.

Appendix D. Results from regression analyses

	Model 2	Model 3	Model 5	Model 6	Model 8	Model 9	Model 11	Model 12
	Job satisfaction		WHO-5 Well-being		Burnout		Turnover intention	
Voice Gap	-0.22***		-0.08*		0.15***		0.14***	
	(-8.72)		(-2.43)		(5.36)		(4.57)	
Voice Gap (worker)		-0.21***		-0.09*		0.12***		0.12***
		(-7.32)		(-2.19)		(3.78)		(3.44)
Voice Gap (organization)		-0.05+		-0.01		0.05+		0.04
		(-1.82)		(-0.36)		(1.73)		(1.28)
Demographic and socioeconomic status [a]	Y	Y	Y	Y	Y	Y	Y	Y
Other job quality measures [b]	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y	Y	Y
Total Observation	1184	1184	1185	1185	1185	1185	1185	1185
Overall R2	0.372	0.561	0.110	0.205	0.274	0.449	0.335	0.337

Standardized beta coefficients; t statistics in parentheses
+ p<0.1 * p<0.05 ** p<0.01 *** p<0.001

a. Demographic and socioeconomic status: gender, age, race, ethnicity, marital status, education level, employment status, tenure, hours worked per week, union member, establishment size.

b. Other job quality measures: earnings from primary job, the number of benefits, schedule unpredictability, job insecurity, career advancement opportunities, job training, schedule freedom, work type (remote, hybrid, onsite fully), job autonomy, skill utilization, task variety, job intensity, job safety (NIOSH), discrimination.

REFERENCES

Avgar, A. C. (2021). Relational exchange in non-union firms: A configurational framework for workplace dispute resolution and voice. *ILR Review*, *74*(3), 607–636. https://doi.org/10.1177/0019793921989615

Berry, C. M., Sackett, P. R., & Landers, R. N. (2007). Revisiting interview–cognitive ability relationships: Attending to specific range restriction mechanisms in meta-analysis. *Personnel Psychology*, 60(4), 837-874. https://doi.org/10.1111/j.1744-6570.2007.00093.x

Budd, J. W. (2004). *Employment with a Human Face: Balancing Efficiency, Equity, and Voice*. Cornell University Press.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, *56*(2), 81–105. https://doi.org/10.1037/h0046016

Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2023). Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. *Asia Pacific Journal of Management*, 1-39. https://doi.org/10.1007/s10490-023-09871-y

Commons, J. R. (1932). *Institutional Economics.* MacMillian.

Credé, M., & Harms, P. D. (2015). 25 years of higher-order confirmatory factor analysis in the organizational sciences: a critical review and development of reporting recommendations. *Journal of Organizational Behavior*, 36(6), 845-872. https://doi.org/10.1002/job.2008

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, *86*(3), 499–512. https://doi.org/10.1037/0021-9010.86.3.499

Detert, J. R., & Burris, E. R. (2007). Leadership behavior and employee voice: Is the door really open? *Academy of Management Journal*, *50*(4), 869–884. https://doi.org/10.5465/amj.2007.26279183

Dobbin, F., & Kelly, E. L. (2007). How to stop harassment: Professional construction of legal compliance in organizations. *American Journal of Sociology*, *112*(4), 1203–1243. https://doi.org/10.1086/508788

Doellgast, V., Bidwell, M., & Colvin, A. J. S. (2021). New directions in employment relations theory: Understanding fragmentation, identity, and legitimacy. *ILR Review*, *74*(3), 555–579. https://doi.org/10.1177/0019793921993445

Dolan, E. D., Mohr, D., Lempa, M., Joos, S., Fihn, S. D., Nelson, K. M., & Helfrich, C. D. (2015). Using a single item to measure burnout in primary care staff: A psychometric evaluation. *Journal of General Internal Medicine*, *30*(5), 582–587. https://doi.org/10.1007/s11606-014-3112-6

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. https://doi.org/10.2307/3151312

Gammarano, R. (2020). Measuring job quality: Difficult but necessary. *ILOSTAT*. https://ilostat.ilo.org/measuring-job-quality-difficult-but-necessary/

Gillet, B., & Schwab, D. P. (1975). Convergent and discriminant validities of corresponding job descriptive index and Minnesota satisfaction questionnaire scales. *Journal of Applied Psychology*, 60(3), 313. https://doi.org/10.1037/h0076751

Grewal, R., Cote, J. A., & Baumgartner, H. (2004). Multicollinearity and measurement error in structural equation models: Implications for theory testing. *Marketing Science*, 23(4), 519-529. https://doi.org/10.1287/mksc.1040.0070

Hertel-Fernandez, A., Nayak, R., & Acuña, T. (2022, April 7). How a new collaboration is helping us improve how we track good jobs. *U.S. Department of Labor Blog*. https://blog.dol.gov/2022/04/07/how-a-new-collaboration-is-helping-us-improve-how-we-track-good-jobs

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, *24*(2), 285–308. JSTOR. https://doi.org/10.2307/2392498

Kerrissey, M. J., Hayirli, T. C., Bhanja, A., Stark, N., Hardy, J., & Peabody, C. R. (2022). How psychological safety and feeling heard relate to burnout and adaptation amid uncertainty. *Health Care Management Review*, *47*(4), 308–316. https://doi.org/10.1097/HMR.0000000000000338

Kinder, M. (2019, November 19). Putting the worker in the future of work. *Brookings*. https://www.brookings.edu/blog/the-avenue/2019/11/19/putting-the-worker-in-the-future-of-work/

Kochan, T. A., Katz, H. C., & McKersie, R. B. (1993). *The Transformation of American Industrial Relations* (second edition). ILR Press.

Kochan, T. A., Yang, D., Kimball, W. T., & Kelly, E. L. (2019). Worker voice in America: Is there a gap between what workers expect and what they experience?: *ILR Review*, *72*(1), 3–38. https://doi.org/10.1177/0019793918806250

Liang, J., Farh, C. I. C., & Farh, J.-L. (2012). Psychological antecedents of promotive and prohibitive voice: A two-wave examination. *Academy of Management Journal*, *55*(1), 71–92. https://doi.org/10.5465/amj.2010.0176

Morrison, E. W., & Milliken, F. J. (2000). Organizational silence: A barrier to change and development in a pluralistic world. *Academy of Management Review*, *25*(4), 706–725. https://doi.org/10.5465/amr.2000.3707697

Muñoz de Bustillo, R., Fernández-Macías, E., Esteve, F., & Antón, J.-I. (2011). *E pluribus unum*? A critical survey of job quality indicators. *Socio-Economic Review*, *9*(3), 447–475. https://doi.org/10.1093/ser/mwr005

O'Brady, S., & Doellgast, V. (2021). Collective voice and worker well-being: Union influence on performance monitoring and emotional exhaustion in call centers. *Industrial Relations: A Journal of Economy and Society*, *60*(3), 307–337. https://doi.org/10.1111/irel.12286

Organ, D. W., Podsakoff, P. M., & MacKenzie, S. B. (2006). *Organizational Citizenship Behavior: Its Nature, Antecedents, and Consequences*. SAGE Publications, Inc.

Palan, S., & Schitter, C. (2018). Prolific.ac—A subject pool for online experiments. *Journal of Behavioral and Experimental Finance*, *17*, 22–27. https://doi.org/10.1016/j.jbef.2017.12.004

Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology*, *70*, 153–163. https://doi.org/10.1016/j.jesp.2017.01.006

Prolific. (2022, July 27). *Representative samples*. Prolific.Co. https://researcher-help.prolific.co/hc/en-gb/articles/360019236753-Representative-samples

Röllmann, L. F., Weiss, M., & Zacher, H. (2021). Does voice benefit or harm occupational well-Being? The role of job insecurity. *British Journal of Management*, *32*(3), 708–724. https://doi.org/10.1111/1467-8551.12471

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior*, *25*(3), 293–315. https://doi.org/10.1002/job.248

Schwab, D. P. (2005). *Research Methods for Organizational Studies* (2nd edition). Psychology Press.

Sherf, E. N., Parke, M. R., & Isaakyan, S. (2021). Distinguishing voice and silence at work: Unique relationships with perceived impact, psychological safety, and burnout. *Academy of Management Journal*, *64*(1), 114–148. https://doi.org/10.5465/amj.2018.1428

Shipton, H., Kougiannou, N., Do, H., Minbashian, A., Pautz, N., & King, D. (2023). Organizational voice and employee-focused voice: Two distinct voice forms and their effects on burnout and innovative behavior. *Human Resource Management Journal*, 1–20. https://doi.org/10.1111/1748-8583.12518

Sull, D., & Sull, C. (2023). The real issues driving the nursing crisis. *MIT Sloan Management Review*. https://sloanreview.mit.edu/article/how-solve-nursing-crisis/

The Aspen Institute. (2022). *Statement on Good Jobs*. https://www.aspeninstitute.org/programs/good-jobs-champions-group/

The Families & Workers Fund. (2022, November 4). *Reimagining Job Quality Measurement.* https://familiesandworkers.org/job-quality-report/

Topp, C. W., Østergaard, S. D., Søndergaard, S., & Bech, P. (2015). The WHO-5 well-being index: A systematic review of the literature. *Psychotherapy and Psychosomatics*, *84*(3), 167–176. https://doi.org/10.1159/000376585

U.S. Census Bureau, U. C. (2023). *Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS)*. Census.Gov. https://www.census.gov/programs-surveys/saipe/guidance/model-input-data/cpsasec.html

U.S. Department of Commerce. (2022). *Job Quality Toolkit: Strategies and actions to help small-to-medium-sized organizations recruit and retain a high-performing workforce*. https://www.commerce.gov/work-us/job-quality-toolkit

Van Dyne, L., Ang, S., & Botero, I. C. (2003). Conceptualizing employee silence and employee voice as multidimensional constructs. *Journal of Management Studies*, *40*(6), 1359–1392. https://doi.org/10.1111/1467-6486.00384

Van Dyne, L., & LePine, J. A. (1998). Helping and voice extra-role behaviors: Evidence of construct and predictive validity. *Academy of Management Journal*, *41*(1), 108–119. JSTOR. https://doi.org/10.2307/256902

Webb, S., & Webb, B. (1897). *Industrial Democracy*. Longmans, Green, and Company.

Wilkinson, A., Dundon, T., Donaghey, J., & Freeman, R. B. (2020). Employee voice: Bridging new terrains and disciplinary boundaries. In A. Wilkinson, J. Donaghey, T. Dundon, & R. Freeman (Eds.), *Handbook of Research on Employee Voice* (2nd Edition, pp. 1–18). Edward Elgar Publishing.