Workplace disability and job satisfaction in Britain: A co-worker test?

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Abstract
The article examines the link between workplace disability (WD) and workplace job satisfaction (JS) using data from WERS2011. Controlling for a rich set of workplace characteristics including organisational culture, the study finds a significant negative relationship between JS and the share of disabled respondents within workplaces. Notably, Seemingly Unrelated Regression (SUR)-based analysis distinguishing between disabled and non-disabled respondents reveals that the negative relationship found is specific to non-disabled respondents. Moreover, disability equality policies are found to be significantly positively related with disabled respondents' JS while they are negatively related with the JS of their non-disabled counterparts. The article ponders if there is a co-worker aspect to the WD–JS link and whether HR policies may need to take heed of co-worker dynamics in this respect.

Keywords
Britain, WERS2011, workplace disability, workplace job satisfaction

Introduction
There are several policy drivers in Britain that make research into issues of workplace disability vital. First, rising life expectancy and the pressure it has put on public finances have led to changes in policy whereby workers are encouraged to extend their working lives beyond the State Pension Age (SPA) (see Phillipson and Smith, 2005, for a review). Extending working lives is likely to increase the incidence of workplace disability, since the prevalence of disability rises with age. Secondly, there has been a policy initiative aimed at encouraging employment among people claiming disability benefit, which was introduced in response to the large increase in the number of claimants in Britain (see, for example, Bewley et al., 2007; Sayce, 2018). More recently, the government has also made a manifesto pledge to halve the disability employment gap and to see 1 million
more disabled people in work within a decade (DWP and DHSC, 2020; DWP and DoH, 2017), which is important given that a significant proportion (40%) of the working age population in Britain is predicted to have a long-term health condition by 2030 (Sayce, 2018). There has been significant progress in terms of the legislative and regulatory framework designed to address the discrimination of disabled people since the introduction of the 1995 Disability Discrimination Act. There has also been rapid development in assistive technology and its dissemination (Hersh and Johnson, 2008), which is likely to promote the employment of disabled people. On the other hand, recent years have witnessed major shocks that may frustrate some of the gains in this respect. For example, the 2008 financial crisis and its fallouts are thought to have led to the rise in low-pay employment and in-work poverty, which were thought to impact marginalised groups such as the disabled disproportionately (Richards and Sang, 2019). There are also some concerns that provisions in the EU social policy, which are favourable to disabled people, may cease to be operational in Britain post Brexit, potentially jeopardising disabled employment (Teague and Donaghey, 2018). Covid-19 may pose by far the most severe of challenges, as marginalised groups may take the brunt of its devastating economic fallouts and the loosening labour market.

The policy initiatives discussed above, and the changing demography of the working age population are likely to increase the proportion of disabled employees in workplaces in Britain. More research is therefore needed to better understand the implications of increased workplace disability on employment outcomes such as job satisfaction. This article attempts to examine empirically if there is a link between workplace disability (WD) and job satisfaction (JS) in Britain and whether there are differences between disabled and non-disabled workers in this respect. To that end, nationally representative data from the most recent Workplace Employment Relations Study survey (WERS2011) and alternative empirical approaches have been used. WD is defined based on employees’ self-reported disability status, including problems related to old age, which affect their day-to-day work activities and from administrative data on the group size of workers with long-term disability provided by employers. Thus, we use the social model of disability distinguishing between ‘impairment’, which is an aspect of an individual, and disability, which is centred on the social arrangements and interactions workers with ‘impairments’ have with their environment (see, for example, Oliver, 1983; Richards and Sang, 2019; Schur et al., 2013). JS is derived from employees’ self-reported responses on nine facets related to their jobs. JS represents an important employment outcome. It reflects both objective aspects of jobs such as pay, which are linked to the workplace, and subjective aspects, which include employees’ aspirations and expectations (Haile, 2017; Perales and Tomaszewski, 2016). There has also been renewed interest in public policy discourses recently on the measurement and analysis of subjective wellbeing outcomes including JS. This is due to the presumed link these outcomes are thought to have with both mental and physical health and thence the broader notion of social wellbeing (Black, 2008; Dolan et al., 2011; Kahneman and Krueger, 2006; Layard, 2013, 2014; OECD, 2018a, 2018b; Rode, 2004; Sousa-Poza and Sousa-Poza, 2000; Warr, 1994, 1999).

Much of the existing evidence linking disability and JS is based on employee-level analysis and indicates that disabled workers fare poorly vis-a-vis non-disabled workers (Fevre et al., 2013, 2016; Jones, 2016; Jones et al., 2014; Perales and Tomaszewski, 2016).
The evidence also points to workplace-related factors being most important determinants of disabled workers’ JS. In fact, several studies find that disabled employees enjoy higher or similar returns in terms of JS vis-a-vis non-disabled employees when these factors are accounted for (Baumgartner et al., 2015; Pagan, 2011; Pagan and Malo, 2009; Schur et al., 2009; Uppal, 2005). What is also of interest to this study is the evidence in the US that co-workers’ and supervisors’ attitudes and stereotypes, which are also workplace characteristics, have been identified as fundamental barriers faced by disabled workers in workplace settings (Colella, 2001; Colella and Bruyère, 2011; Schur et al., 2009; Vornholt et al., 2018). Fevre et al. (2013) provide some evidence in Britain, which is broadly consistent with the US evidence, but underscore the dearth of evidence in Britain on co-worker or client instigated ill-treatment disabled employees experience.

If non-disabled co-workers harbour negative attitudes towards disabled employees, it is not clear what the implication of this may be in the face of the potentially rising share of disabled employees in workplaces. This article aggregates the JS of employees within WERS2011 workplaces and conducts workplace-level analysis. The article is novel in distinguishing between disabled and non-disabled employees, which may allow capturing potential co-worker dynamics in the WD–JS link. The results obtained reveal that: (1) the mean level of workplace JS is significantly negatively related to the share of disabled respondents (%disabled) within workplaces; (2) Seemingly Unrelated Regression (SUR)-based analysis distinguishing between the mean levels of workplace JS for disabled and non-disabled respondents uncovers that the negative relationship found is exclusive to non-disabled respondents; and (3) disability-friendly workplace policies are found to be significantly positively related to the mean level of workplace JS for disabled respondents while they are negatively related to that of non-disabled respondents. The results suggest intergroup dynamics as a potentially important factor given that the negative relationships found are specific to non-disabled co-workers. Such intergroup dynamics may arise due to co-worker attitude (e.g. Fevre et al., 2013), ableism (e.g. Jammaers et al., 2016) or accommodations (e.g. Colella, 2001) as highlighted in the section below.

The remainder of the article is organised as follows. The following section provides a review of the related literature. The third section describes the data used in the empirical analyses conducted. The fourth section discusses the empirical framework used. The fifth discusses the results before the final section concludes the article.

**Background and related literature**

Various recent estimates put the proportion of working age people with long-standing illness or impairment in Britain to be around 30% of the population. Of this, some 17% have a limiting long-term illness, impairment, or a disability (DWP, 2014; HLSC, 2016; Jones and Wass, 2013). Moreover, the proportion of people with a long-term health condition is predicted to reach 40% of the working age population by 2030 (Sayce, 2018). Thus, disabled people constitute a significant and rising proportion of the labour force. Correspondingly, the proportion of disabled employees is expected to increase given the changes in public policy priorities alluded to earlier, which include extending working lives beyond the SPA and the drive to encourage employment among disability benefit claimants. Given such changes in the workforce and in workplaces, the need for
more research into WD and employment outcomes in Britain cannot be overemphasised, a point several of the studies reviewed below stress.

Notwithstanding the considerable variation in disability conditions, the evidence suggests that disabled people fare worse in labour market outcomes generally vis-a-vis their non-disabled counterparts. For example, the latest Office for National Statistics (ONS) data indicate that only 53.2% of disabled people were in employment versus 81.8% of non-disabled people, thus an employment gap of 28.6% (DWP and DHSC, 2020; DWP and DoH, 2017; ONS, 2019a, 2019b). Disabled people not only face employment hurdles, but they also experience work-related challenges once they join the world of work. Based on a qualitative study of disabled respondents in Scotland, which included hard-to-reach disabled people selected using convenience sampling, Richards and Sang (2019) highlighted experiences of discrimination, which they note were: ‘typically related to management failure to grant adequate, reasonable adjustments, as well as long histories of patronising and insensitive comments from managers and colleagues’ (p. 648). Fevre et al. (2016) conducted extensive study in Britain using data from three large-scale household surveys (the LFS, GHS and HSE). They underscored the disadvantage disabled employees experienced across various employment outcomes, stressing: ‘even those who are most directly affected often fail to understand the extent of disability discrimination’ (p. 3), while Fevre et al. (2013) noted that disabled employees were far more likely to experience a wide range of ill-treatment in workplaces using data from the British Workplace Behaviour Survey. The 2016 House of Lords Select Committee (HLSC) report on whether the Equality Act 2010 adequately supports the fight against disability discrimination also concluded that much more needs to be done in this respect (HLSC, 2016).

There is still insufficient evidence on disability-related disadvantage in employment outcomes, however. Fevre et al. (2013, 2016) pointed that little is known about the ill-treatment of disabled employees by co-workers and called for ‘better knowledge of the extent to which the seemingly individual problems disabled people encounter in the workplace are part of a wider and more systematic pattern of less favourable treatment’ (2016: 3). Much of the limited evidence also focuses on disparities in terms of objective outcomes such as employment, pay, job security/layoff, promotions, decision making and training, among others, where the broad consensus is that disabled employees fare worse in these outcomes vis-a-vis their non-disabled counterparts (Ameri et al., 2018; Baldwin and Schumacher, 2002; Berthoud, 2008, 2011; Berthoud and Blekesaune, 2007; Fevre et al., 2013, 2016; Jones, 2006, 2007, 2008; Jones and Latreille, 2010; Kidd et al., 2000; Madden, 2004; Richards and Sang, 2019; Schur et al., 2009). On the other hand, the evidence on disparities in subjective outcomes such as JS is even more limited despite renewed interest in public policy discourses on subjective wellbeing outcomes in Britain and elsewhere, which is informed by the link these outcomes are thought to have with the broader notion of mental health and social wellbeing (Black, 2008; Dolan et al., 2011; Kahneman and Krueger, 2006; Layard, 2013, 2014; OECD, 2018b; Rode, 2004; Sousa-Poza and Sousa-Poza, 2000; Warr, 1994, 1999). In Britain, stress, depression, or anxiety constitutes the most frequently self-reported work-related ill health (HSE, 2020; Vickerstaff et al., 2012), therefore making a study of this nature vital.

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The evidence on the link between disability and JS, which appears to vary greatly depending on whether and how far workplace characteristics are accounted for, is not entirely clear-cut. In Britain, there is a consensus that disabled workers fare poorly vis-a-vis their non-disabled counterparts though much of this evidence is based on employee-level analysis. Hoque et al. (2018) used data from WERS2011 to test for disparities related to employees’ disability status in the link between selected high performance work practices (HPWP) and employees’ work-related wellbeing outcomes including JS. They found that disabled respondents report lower work-related wellbeing compared to their non-disabled counterparts, but they conclude that the evidence on whether this is linked to the presence of HPWP is limited. Based on the raw comparison of the responses of disabled and non-disabled employees surveyed by WERS2011, Fevre et al. (2016) indicated an about 10% lower average JS score for the former. They noted that the JS gap was significant not only because it forms an important aspect of one’s life satisfaction but also due to its well-established link with employee productivity and intention to quit. Perales and Tomaszewski (2016) also used data from WERS2011 to find that workers with a lasting health condition have lower job satisfaction compared to their counterparts without any such disability. Using an earlier wave of WERS (WERS2004), Jones (2016) also reported a significant gap in work-related perceptions between disabled and non-disabled employees, where disabled employees are found to hold more negative views on managers’ treatment of workers as well as reporting significantly lower job satisfaction and commitment to their organisation.

Internationally, Baumgartner et al. (2015) used data on 4141 employees in 110 small and medium-sized companies in Germany and found that disabled employees were less satisfied than their non-disabled counterparts in highly centralised environments. However, in decentralised organisational settings they found higher levels of job satisfaction particularly for disabled employees and concluded that HR policies need to promote flexible working environments. Jones et al. (2014) report work-limiting disability reducing job satisfaction in a causal manner in their study using data from the Australian HILDA survey. Pagan (2011) examined the levels of job satisfaction of older (aged 50–64) disabled and non-disabled workers in Europe using data from the Survey of Health, Ageing and Retirement in Europe (2004 and 2007). He found that older disabled workers with limiting conditions were less likely to be satisfied with their jobs vis-a-vis their non-disabled counterparts. However, his Oaxaca–Blinder decomposition-based analysis revealed that ‘older workers with limiting disabilities enjoy greater returns in terms of satisfaction from their job characteristics’ (p. 213), which he attributed to disabled workers’ lower expectations about jobs. Pagan and Malo (2009) find a similar result and arrive at the same conclusion based on their study, which used Spanish data from the European Community Household Panel (ECHP). Shier et al. (2009) conducted a qualitative study in Canada and concluded that the presence of workplace and employer discrimination and labelling, rather than the lack of accommodative practices and measures in the workplace, is the main reason preventing disabled people from succeeding in the labour market.

In a large-scale study involving 30,000 employees from 14 companies in the US over the period 2001–2006, Schur et al. (2009) also found results that highlighted the importance of workplace-related factors. They reported that where employees reported higher
levels of company fairness and responsiveness, there was no significant gap between disabled and non-disabled employees in terms of job satisfaction, company loyalty, willingness to work hard and turnover. Where employees reported lower levels of company fairness and responsiveness, however, they found a significant gap between disabled and non-disabled employees in terms of these outcomes. They concluded that corporate cultures which are responsive to the needs of all employees are especially beneficial for disabled employees. Similarly, Uppal (2005) used nationally representative Canadian data to find that some disabled workers (with mobility disability) no longer had lower job satisfaction compared to their non-disabled counterparts once workplace characteristics were controlled for. He concluded that workplace-related factors such as discrimination, harassment and the lack of assistive technology or sufficient employer accommodations were the likely reasons for the disparity in job satisfaction for other types of disabilities.

The evidence reviewed here points to workplace-related factors being critical determinants of disabled workers’ JS and disparities therein vis-a-vis their non-disabled counterparts. This calls for workplace-level analysis that may shed new light on the role played by job- and workplace-related factors. What is also of particular interest is the evidence of co-worker attitudes and stereotypes forming major workplace barriers for disabled workers (Beatty et al., 2019; Colella, 2001; Colella and Bruyère, 2011; Schur et al., 2009; Vornholt et al., 2018). For example, in their US-based study Schur et al. (2009) highlighted that ‘supervisor and co-worker attitudes have a profound impact on the employment experiences of people with disabilities’ (p. 385). Colella (2001) discussed disability-related accommodation and workplace dynamics among co-workers, where co-workers as stakeholders in the accommodation process was highlighted following some court decisions that ‘have taken co-worker reactions into account in cases where an accommodation was judged contrary to a collective bargaining agreement . . . because co-workers’ negative responses (in the form of grievances) would make the accommodation “unreasonable”’ (p. 101). Schur et al. (2014) noted the possibility of a positive or negative spillover effect of partially granted or denied accommodation requests on co-workers but concluded that their mixed-methods study covering more than 5000 employees did not find negative co-worker reactions. Stone and Colella’s (1996) model emphasised the importance of non-disabled co-workers’ cognition and affective states in determining the type of treatment disabled workers receive.

Given the evidence of non-disabled co-workers’ unfavourable attitude towards disabled employees (Fevre et al., 2013; Schur et al., 2009), which may be related to ableism (Jammaers et al., 2016; Mik-Meyer, 2016) or accommodations (Colella, 2001; Stone and Colella, 1996) or other, the increase in the proportion of disabled employees in workplaces may lead to workplace dynamics that may be negatively related to workplace JS overall. Also, if disabled workers were to have lower expectations about jobs (Pagan, 2011; Pagan and Malo, 2009), then the JS of non-disabled co-workers may be where the adverse WD–JS link is reflected. In Britain we do not have data that capture co-worker attitudes in workplace settings. This article attempts to overcome this challenge using a novel approach of aggregating the JS of disabled and non-disabled employees within WERS2011 workplaces. It is hoped that this approach allows capturing co-worker attitude indirectly. Moreover, much of the evidence in Britain is based on employee-level
analysis, while this article undertakes a workplace-level analysis, which is a departure from much of the literature in its own right.

Data and variables

The data come from the 2011 British Workplace Employment Relations Survey (WERS) (Department for Business, Innovation and Skills et al., 2015). The 2011 survey constitutes the most recent and authoritative source of information on employment relations in Britain covering a battery of topics on employers and employees. The survey solicited responses from managers and employees through: (1) a management questionnaire, which was administered in a face-to-face interview with managers in charge of the day-to-day task of employment relations and (2) an employee questionnaire, which was self-completed by up to 25 employees in study workplaces. WERS offers linked employer–employee data representative of all workplaces in Britain with five or more employees provided that are suitably weighted, covering all sectors except agriculture and mining (Van Wanrooy et al., 2013).

The 2011 survey monitored 2680 establishments in total, 1923 of which took part in the employee surveys. The elimination of missing values on relevant workplace and employee characteristics led to the retention of 1716 workplaces, which account for 89.2% of the workplaces with the employee survey. Of the retained 1716 workplaces, 947 had at least one respondent with a self-reported disability (see details in the next subsection), while the remaining 769 workplaces had none. Of the 947 workplaces, 933 workplaces had a mix of respondents with and without disabilities, while 14 workplaces had all respondents reporting to have disabilities. As detailed in the section on empirical methodology, the analysis examining the JS differentials between workplaces with and without disabled respondents uses all 1716 workplaces in the final sample. On the other hand, the analyses investigating the within-workplace differential in the WD–JS link between disabled and non-disabled employees, which necessitates a mix of respondents with and without disabilities, rely on the 933 workplaces, thus covering 48.5% of the workplaces with responding employees. All the empirical analysis undertaken in this article uses weights provide by the WERS to account for sample selection probabilities (see Van Wanrooy et al., 2013: 212–213).

Workplace disability (WD) control

The WERS2011 survey has two sources of disability information. First, the survey monitored disability status based on employees’ own responses to the question: ‘Are your day-to-day activities limited because of a health problem or disability which has lasted, or is expected to last, at least 12 months? Please include problems related to old age’, with three possible answers of ‘no’, ‘yes, limited a little’ and ‘yes, limited a lot’. In the original sample of workplaces with responding employees, 89.6%, 8.3% and 1.3% of the respondents reported ‘no’, ‘yes, limited a little’ and ‘yes, limited a lot’ respectively. If an employee responded ‘yes’ to the disability question, i.e. regardless of whether the condition limits one’s day-to-day activities ‘a little’ or ‘a lot’, the employee is regarded as
disabled in this study. Secondly, the survey also solicited employers’ responses on the following two questions: (1) ‘Currently how many employees do you have on the payroll at this workplace?’ (total number of employees) and (2) ‘How many have a long-term disability that affects the work they can do?’ (number of disabled employees). Responses to these two questions were then used to generated a \( \% \text{disabled measure of WD} \) as:

\[
\% \text{disabled} = \left( \frac{\text{No. of disabled employees}}{\text{Total no. of employees}} \right) \times 100.
\]

The mean level of \( \% \text{disabled} \) across all workplaces is 9.2% (SD = 13.4) while it is 16.7% (SD = 14.1) among workplaces with at least one disabled respondent.

The use of both the employee- and employer-provided responses on disability is justified for two reasons. First, the employee self-reported disability status is vital to construct the mean levels of JS for disabled and non-disabled respondents within each workplace (see details in the next sub-section). Secondly, the use of the employer-provided response to generate the \( \% \text{disabled} \) measure is likely to be superior to using just the employee responses, since it avoids the risk of identifying a workplace with a non-responding disabled employee as a non-disabled workplace (i.e. \( \% \text{disabled} = 0 \)). This is a real risk given that disabled employees are a minority in workplaces to begin with (<10% of all respondents report a disability) and only up to a maximum of 25 employees would complete the employee survey in each workplace. Therefore, even though the employee response may be a better information source in identifying individual disability conditions (see, for example, Hoque et al., 2018; Schur et al., 2013 on measurement issues), using it to generate a workplace measure of \( \% \text{disabled} \) can be risky on account of the higher likelihood of non-response by a minority group. Also, some of the literature reviewed alludes to disability adjustment/accommodation being part of the reason for co-worker and employer attitudes. For that to be the case, the disability condition needs to be known by employers, which makes the employer-provided information a better data source to construct \( \% \text{disabled} \) as done here.

**Job satisfaction (JS) outcomes**

The WERS2011 survey solicited employees’ responses on nine facets of JS. The survey asked employees: ‘how satisfied are you with the following nine aspects of your job’: ‘sense of achievement from work’; ‘scope for using own initiative’; ‘amount of influence over job’; ‘training received’; ‘opportunity to develop skills’; ‘amount of pay received’; ‘job security’; ‘the work itself’; and ‘involvement in decision making’, which they rate from ‘very satisfied’ to ‘very dissatisfied’ on a five-point Likert scale. Principal Component Analysis (PCA) on the nine facets of JS identified a single factor with an Eigenvalue above 1 (4.72) and a Kaiser–Meyer–Olkin (KMO) sampling adequacy measure of 0.90. We therefore generated a summative JS outcome for each employee by adding across the nine domains. Thus, the summative job satisfaction outcome for each worker \( i \) in a workplace \( j \) with responses for each of the \( k \) domains of satisfaction is obtained as:

\[
JS_{ij} = \sum_{k=1}^{9} JS_{ijk}, \quad \text{where} \quad 1 \leq i \leq 25; \quad j = 1, ..., 1716, \quad \& \quad k = 1, ..., 9.
\]

The summative job satisfaction measure (\( JS_{j} \)) is then used to generated three outcomes as follows. First, the mean level of workplace job satisfaction (\( JS_{j} \)) is obtained
as: $\bar{JS}_j = \frac{\sum_{i=1}^{N} JS_{ij}}{N_j}$. Secondly, we disaggregate the JS scores by respondent disability status. Having identified disabled employees in this way, we then obtain separate mean levels of workplace JS for disabled ($\bar{JS}_j^D$) and non-disabled ($\bar{JS}_j^N$) respondents within a workplace, respectively, as: $\bar{JS}_j^D = \frac{\sum_{i=1}^{N} JS_{ij}^D}{N_j^D}$ and $\bar{JS}_j^N = \frac{\sum_{i=1}^{N} JS_{ij}^N}{N_j^N}$, where $N_j^D$ and $N_j^N$ represent the total number of disabled and non-disabled employees in a workplace so that: $N_j = N_j^D + N_j^N$. Appendix Table A0 provides descriptive statistics on these three mean levels of workplace job satisfaction outcomes.

**Workplace disability equality and other controls**

A count measure of workplace disability policies and practices has been generated from employers’ ‘yes’/’no’ responses to the following seven questions on whether the workplace: ‘has a formal strategic plan on employee diversity’, ‘the strategic plan explicitly mentions disability’, ‘monitors promotion to identify indirect discrimination by disability’, ‘reviews promotions to identify indirect discrimination by disability’, ‘reviews relative pay to identify indirect discrimination by disability’, and ‘whether employer has special procedures to encourage workers with disabilities’ and ‘has made formal assessment of accessibility of the workplace to those with disabilities’.

Organisational culture is found to be an important determinant of the experiences of disabled workers (see, for example, Schur et al., 2009, 2013). Taking this into account we generate a measure of ‘organisational culture’ based on employees’ response to the following seven questions on their perceptions of how managers in their workplace: ‘Can be relied upon to keep to their promises’, ‘Are sincere in attempting to understand employees’ views’, ‘Deal with employees honestly’, ‘Understand about employees having to meet responsibilities outside work’, ‘Encourage people to develop their skills’, ‘Treat employees fairly’ and finally, ‘In general, how would you describe relations between managers and employees here?’ The responses to these questions are provided based on a five-point Likert scale from ‘strongly agree’ to ‘strongly disagree’ (first six questions) and ‘very good’ to ‘very poor’ (seventh question). Principal Component Analysis (PCA) identified a single factor with an Eigenvalue above 1 (4.95) explaining more than 94% of the variation and with a Kaiser–Meyer–Olkin (KMO) sampling adequacy measure of 0.94. We therefore generated a summative organisational culture measure with the resulting scale running from 1 to 29. The summative organisational culture measure was aggregated (in a similar fashion to the way JS was aggregated above) to generate a mean level of workplace organisational culture.

In addition, several other workplace-level controls have been generated for use in the empirical analysis conducted, which include demographic composition of employees in terms of gender, old/age and ethnicity; proportions of employees on part-time contract; proportion of employees on minimum wage; workplace age; workplace size; whether single or multi-plant workplace; whether there is a recognised trade union; whether public or private ownership; type of industry; and geographic location.
Empirical methodology

The article uses two different empirical approaches. The first approach is meant to establish the JS–WD link and regresses the mean level of JS among employees at a workplace \( j \) (\( \bar{JS}_j \)) on a rich set of workplace controls specific to the organisation. The estimated model has the following general form:

\[
\bar{JS}_j = \alpha_j + \delta WD_j + X_j \beta + \varepsilon_j, \quad j = 1, \ldots, J
\]

where the subscript \( j \) indexes workplaces; \( WD \) represents the % of disabled employees in a workplace; \( X \) stands for the vector of workplace characteristics, which include measures of disability equality policy and organisational culture, and \( \varepsilon \) represents the (workplace-level) idiosyncratic error term.

The second empirical approach seeks to determine if there are differences in the JS–WD relationship between disabled and non-disabled employees within workplaces. This is achieved by using mean levels of JS disaggregated by the disability status of respondents within each workplace described in the previous section. In other words, here we regress the mean levels of JS among disabled (\( \bar{JS}^D_j \)) and non-disabled (\( \bar{JS}^N_j \)) employees within a workplace \( j \) on a rich set of workplace characteristics. Since the disaggregated JS outcomes come from two different groups of employees within the same workplace, they are likely to be correlated due to shared observable and unobservable workplace-level influences. Given this, it is important that they are modelled jointly, which is achieved using Seemingly Unrelated Regression (SUR) (Zellner, 1962) with the following form:

\[
\begin{align*}
\bar{JS}^D_j &= \alpha_j^D + \delta_j^D WD_j + X_j^D \beta_j^D + \varepsilon_j^D \\
\bar{JS}^N_j &= \alpha_j^N + \delta_j^N WD_j + X_j^N \beta_j^N + \varepsilon_j^N
\end{align*}
\]

where, as before, the subscript \( j \) indexes workplaces; the superscripts \( D \) and \( N \) represent disabled and non-disabled employees, respectively; \( WD \) is the % of disabled employees in a workplace \( j \); \( X \) stands for the vector of workplace characteristics including measures of disability equality policy and organisational culture as before, and \( \varepsilon \) in each equation represents the idiosyncratic error term associated with each group of employees, which are assumed to be conditionally homoscedastic, independent across workplaces and with zero mean. As noted earlier, within a workplace it is likely that \( E(\varepsilon_j^D \varepsilon_j^N | WD_j, X_j) = \sigma_{D,N}^2 \neq 0 \). The SUR framework, which is implemented using the Stata software (StataCorp, 2019), accounts for such correlation between the two equations using the GLS estimator, which also provides chi-squared statistics from the Breusch–Pagan test on the independence of the errors from the jointly estimated equations.\(^{11}\)
Empirical results and discussion

Table 1 reports results based on the first specification (equation 1). The estimated coefficients from the baseline and fully specified models both for the full sample (left pair of columns) and those from the sensitivity analysis (middle and right pairs of columns) suggest that the mean level of workplace JS is negatively related with the % of disabled employees in a workplace. The results are significant in all cases at the conventional or better level of significance, suggesting a strong negative relationship between the two. The results from the sensitivity analysis suggest that the negative relationship found is stronger in smaller sized (<50 employees) workplaces. This may suggest that in smaller establishments, where perhaps there are less developed HRM structures to accommodate disabled workers better, increasing the proportion of disabled workers leads to less favourable outcomes in terms of the mean level of workplace JS.

The estimated coefficients on the perceptions of organisational culture control are positive and strongly significant both for the main model and for the sub-group analysis. There is therefore strong evidence suggesting that employees’ perception of good organisational culture promotes workplace job satisfaction significantly. What is noteworthy is that the link found is stronger for smaller-sized organisations. Thus, employees’ perceptions of good organisational culture seem to be particularly important in smaller organisations, where the positive influences of trade unions and well-developed HRM structures may be lacking. On the other hand, none of the estimated coefficients of the disability equality control variable in Table 1 is found to be statistically significant.

Table 1. Workplace job satisfaction and disability, estimates from OLS.

|                | Full sample | Size <50 | Size 50 or more |
|----------------|-------------|----------|-----------------|
| % Disabled     | -0.075**    | -0.068** | -0.118***       |
|                | (0.033)     | (0.028)  | (0.052)         |
| Disability equality | -0.048     | -0.095   | -0.039          |
|                | (0.070)     | (0.099)  | (0.073)         |
| Organisational culture | 0.521***  | 0.630*** | 0.508***       |
|                | (0.035)     | (0.042)  | (0.038)         |
| Other workplace controls | no       | yes      | no              |
| Constant       | 31.430***   | 22.404***| 32.043***       |
|                | (0.138)     | (1.140)  | (0.416)         |
| Observations   | 1716        | 775      | 941             |
| R-squared      | 0.008       | 0.520    | 0.654           |

Estimation used WERS2011 establishment sampling weights.
Robust standard errors in parentheses.
***p < 0.01, **p < 0.05, *p < 0.1.
Table 2 reports results from the SUR regression (equation 2) for the sub-set of workplaces with a mix of disabled and non-disabled employees. It represents by far the most important part of the analysis in this study for two reasons. First, this analysis is based on workplaces with a mix of disabled and non-disabled respondents thus allowing us to capture potential intergroup dynamics within workplaces. Secondly, it is also superior methodologically on account of the joint estimation of the JS equations of disabled and non-disabled respondents, which accounts for potentially correlated unobserved workplace characteristics. In addition, the SUR framework allows us to test for the joint significance of estimated coefficients from the two equations estimated jointly.

Once again, we have a baseline specification with only the ‘%disabled’ control and a fully specified model, which controls richly for workplace characteristics including organisational culture and disability equality policies and practices. In all cases, the Breusch–Pagan tests of independence of the job satisfaction equations for disabled and non-disabled respondents reject the null hypothesis of ‘no contemporaneous correlation’, thus lending support for the joint estimation strategy adopted. Also, tests on the joint significance of the WD, the organisational culture and the disability equality measures have been carried out; and the results obtained reject the null hypotheses that the respective coefficient estimates are zero.

The estimated coefficients on the %disabled employee control in the baseline and the fully specified models reveal that the statistically significant negative relationship found earlier between JS and WD is specific to non-disabled respondents. Thus, it appears that the higher the proportion of disabled workers in a workplace, the more adverse its influence would be on the mean level of workplace JS of non-disabled co-workers. The baseline and fully specified results from the SUR models in Table 2 also reveal a remarkable result, which the earlier specification concealed. Accordingly, workplace disability

Table 2. Workplace job satisfaction and disability, estimates from SUR.

|                        | Disabled | Non-disabled | Disabled | Non-disabled |
|------------------------|----------|--------------|----------|--------------|
| % Disabled             | -0.071   | -0.118***    | -0.076   | -0.077***    |
|                        | (0.052)  | (0.024)      | (0.049)  | (0.020)      |
| Disability equality    |          |              | 0.436*** | -0.093**     |
|                        |          |              | (0.113)  | (0.045)      |
| Organisational culture |          |              | 0.471*** | 0.487***     |
|                        |          |              | (0.063)  | (0.025)      |
| Other workplace controls | no     | no           | yes      | yes          |
| Constant               | 29.887***| 31.502***    | 23.081***| 23.391***    |
|                        | (0.201)  | (0.094)      | (5.702)  | (2.287)      |
| Observations           | 933      | 933          | 933      | 933          |
| R-squared              | 0.005    | 0.025        | 0.286    | 0.489        |

Estimation used WERS2011 establishment sampling weights.
Standard errors in parentheses.
***p < 0.01, **p < 0.05, *p < 0.1.
equality policies and practices are found to have a strongly significant positive relationship with the mean level of workplace JS of disabled employees ($\bar{JS}_D$), but a strongly significant negative relationship with that of their non-disabled counterparts ($\bar{JS}_N$). Therefore, it appears that disability equality policies and practices do seem to have their desired and favourable influence on the job satisfaction of disabled employees. On the other hand, these policies and practices are found to have a significant adverse influence on the workplace JS of non-disabled co-workers. These two results seem to reinforce each other in that the job satisfaction of non-disabled co-workers is significantly adversely linked with the share of disabled employees in workplaces. The latter, of course, is expected to increase where there are policies and practices favourable to disabled employees. The question of why this is the case cannot be fully addressed based on the results we have here. However, the review of literature earlier in the article has highlighted candidate explanations that tackle co-worker dynamics, which may provide some answers. Specifically, co-worker dynamics related to disability accommodations (Colella, 2001; Colella and Bruyère, 2011; Vornholt et al., 2018), ableism (Jammaers et al., 2016; Mik-Meyer, 2016) or even attitude (Fevre et al., 2013; Schur et al., 2009) could hold the key to why there may be a negative relationship between the share of disabled workers in a workplace and the JS of non-disabled co-workers. If non-disabled co-workers harbour negative attitudes towards disabled workers or have some concerns about their abilities or indeed the accommodations given to them, then the greater the number of disabled workers in the workplace the greater the intensity of such attitudes and concerns may become. As can be seen from Table 2, better perceptions of organisational culture are once again found to have a strongly significant positive link with the mean level of workplace job satisfaction irrespective of respondents’ disability status.

Table 3 reports results from the establishment size-based sensitivity analysis from SUR. The results from the baseline and fully specified models confirm the significant negative relationship between ‘%disabled’ and the mean level of workplace JS for non-disabled respondents found earlier. The sub-group analysis also reinforces the establishment size related patterns observed in Table 2, where the negative relationship found was noted to be stronger for smaller-sized (<50 employees) workplaces. Thus, based on results from the fully specified models, the negative association found between ‘%disabled’ and the mean level of workplace JS for non-disabled co-workers is stronger (in fact, twice so) in smaller workplaces vis-a-vis workplaces with 50 or more employees. This result seems to be consistent with what we speculated earlier that in smaller organisations, where well-developed HRM structures and institutions such as trade unions may be lacking (i.e. vis-a-vis larger organisations), the co-worker dynamics might not have alternative venting channels, thus the adverse link ending up being stronger there.

The estimated coefficients from the establishment size-based sensitivity analysis indicate that the results related to the disability equality policy and practice control variable are significant only in larger establishments. This is not entirely surprising given that it is larger establishments with relatively well-developed HRM structures and employee representation (in the form of unions) to monitor them that are more likely to adopt and implement such equality policies and practices. For smaller establishments, the directions of the relationship for disabled and non-disabled respondents still hold although
Table 3. Workplace job satisfaction and disability, estimates from SUR (sensitivity analysis).

|                      | Est. size <50                        |                      | Est. size 50+                        |                      |
|----------------------|--------------------------------------|----------------------|--------------------------------------|----------------------|
|                      | Disabled Non-disabled                 | Disabled Non-disabled| Disabled Non-disabled                 | Disabled Non-disabled|
| % Disabled           | 0.003 (0.080)                         | -0.152*** (0.046)    | 0.083 (0.074)                        | -0.141*** (0.031)    |
| Disability equality  | 0.018 (0.246)                         | -0.159 (0.102)       | 0.083 (0.074)                        | -0.141*** (0.031)    |
| Organisational culture| 0.432*** (0.102)                      | 0.500*** (0.042)     | 0.458*** (0.102)                     | -0.081* (0.047)      |
| Other workplace controls | no no yes yes                      | no no yes yes       | no no yes yes                      | no no yes yes       |
| Constant             | 29.330*** (0.383)                     | 31.681*** (0.222)    | 21.525*** (4.272)                    | 22.201*** (1.774)    |
| Observations         | 289                                  | 289                  | 289                                  | 289                  |
| R-squared            | 0.004                                | 0.033                | 0.364                                | 0.684                |

Estimation used WERS2011 establishment sampling weights.
Standard errors in parentheses.

***p < 0.01, **p < 0.05, *p < 0.1.
insignificant statistically. The estimated coefficients on the perceptions of organisational culture control variable reveal a strongly significant positive relationship regardless of establishment size, thus suggesting once again that better perception of organisational culture is linked to favourable JS outcomes irrespective of respondent disability status or organisational size.

**Summary and conclusion**

This study sought to examine the link between workplace disability (WD) and job satisfaction (JS) in Britain. It argued that workplaces are likely to have more disabled workers given the changing workforce demographics and public policy priorities such as the increase in State Pension Age (SPA), the promotion of disabled people’s employment through the raft of legislative measures as well as the rapid development in assistive technologies and their distribution. The potential adverse impacts of recent national and international shocks on the experiences of disabled workers were also highlighted. The article posed the question of whether the growing workplace share of disabled employees might lead to workplace dynamics among co-workers which may influence some employment outcomes. It then examined the potential link between workplace disability and job satisfaction, given that the latter reflects both objective aspects of jobs (such as job tenure, pay and promotion) and employees’ own subjective assessments including their aspirations and expectations. To that end, a review of the literature was carried out followed by empirical analysis using rich data from WERS2011 and alternative empirical approaches. As highlighted, job satisfaction is an integral part of overall wellbeing, fitting within the broader notion of mental health and directly contributing to several employment and workplace outcomes.

The literature review highlighted: (1) the importance of co-worker dynamics relating to non-disabled co-workers’ negative attitudes towards disabled workers or wrong perceptions about the ability of disabled workers or the workplace accommodations they may be given; (2) job- and workplace-related factors being most important in determining the JS of disabled workers and disparities therein vis-a-vis non-disabled workers; (3) the need for a workplace-level analysis in contrast to much of the evidence in Britain, which is based on employee-level analysis; and (4) the WD–JS link being not entirely clear-cut, especially when international evidence is taken into account. Taking these into account, the article used a novel approach to conduct a workplace-level analysis distinguishing between the workplace JS of disabled and non-disabled workers. It is thought that the approach adopted allows to determine potential co-worker dynamics in the WD–JS link.

The results obtained indicated that: (1) there is a significant negative relationship between the mean level of workplace JS in a workplace and the share of disabled employees (%disabled) within the workplace; (2) the negative relationship between %disabled and the mean level of workplace JS found is specific to non-disabled co-workers; and (3) there is a statistically significant positive relationship between the mean level of workplace job satisfaction for disabled employees and workplace disability policies and practices. As argued earlier, the two latter results reinforce each other in that where there are policies and practices that support disabled employees better, they score better in job
satisfaction terms. On the other hand, the same policies and practices are found to be significantly negatively related with the job satisfaction of non-disabled co-workers. The article speculated if this may be due to co-worker dynamics related to disability accommodations (Colella, 2001; Colella and Bruyère, 2011; Vornholt et al., 2018), ableism (Jammaers et al., 2016; Mik-Meyer, 2016) or even attitude (Fevre et al., 2013; Schur et al., 2009). In addition, the article also found better employee perception of good workplace culture to be significantly positively related with workplace job satisfaction, which is in line with the findings of Scheur et al. (2014) and Kochan et al. (2003).

There is a well-established link between job satisfaction and employee turnover. If non-disabled co-workers were dissatisfied at their work due to prejudices or wrong perceptions about the accommodations accorded to their disabled co-workers, that may lead them to quit their jobs, or it may send the wrong signal to employers who might fear that they will. This might also discourage workplace accommodations aimed at supporting disabled workers. However, in a situation where the share of disabled co-workers is increasing due to the changing workforce demographics and the policy drivers aimed at promoting disabled employment, quits by non-disabled co-workers or employers’ concerns about them are unlikely to be the remedy. What is likely to be the panacea is for workplace policies and HRM practices to address potentially unfavourable outcomes arising from co-worker dynamics head-on. This could be achieved through formal inclusion and diversity training to curtail negative attitudes and misconceptions about the abilities of disabled workers, or the accommodations they require. Where these are non-existent, workplaces may also put in place key performance indicators targeting non-disabled employees and supervisors to ensure training effectiveness and better accommodation of disabled workers.

Finally, the study is novel in its use of workplace-level analysis and in distinguishing between disabled and non-disabled co-workers within workplaces. It is also rigorous in its use of rich data and alternative empirical approaches, including the sensitivity analysis conducted. The results obtained are very robust. On the other hand, there are some caveats worth pointing out. The nine domains of JS considered do not directly monitor co-worker attitude towards disabled workers. We may, therefore, be measuring this indirectly at best. It is also worth pointing out the well-known measurement error concerns associated with self-reported information on disability (see, for example, Baumberg et al., 2015; Hoque et al., 2018 on measurement issues). The workplace-level aggregation of JS might minimise such errors in the statistical sense, though there is the other well-established concern that there is a great deal of variation in disability conditions across employees. Moreover, the reliance on the WERS2011 cross-section may not address potential endogeneity problems. On the other hand, the robustness of the results to alternative econometric specifications and the consistency in the direction of significance observed between the baseline and the fully parametrised specifications give us some confidence in this respect. At the very least, the article has highlighted the need for further research on disability to focus on the dynamics vis-a-vis non-disabled co-workers, which may be best served by mixed-methods research. In this regard, it is also worth pointing out that the WERS2011 data are almost a decade old now. Although the literature review provided a more recent account of disabled workers and their labour market fortunes, it may be time to revisit the survey, preferably with some additional questions that will allow monitoring co-workers’ attitudes directly.
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Notes
1. The prevalence of disability among adults over the State Pension Age stands at 45% compared with that for working age adults, which is 16% (DWP, 2014).
2. Other outcomes include employment-related benefits such as pay, training, turnover and promotion.
3. See ‘Data and variables’ section for the exact wording of the employee and employer survey questions.
4. Compared with other European countries Britain is reported to have larger numbers of people with long-term illnesses, although the figures are comparable to that of the USA (Blekesaune, 2007; EHRC, 2008; OECD, 2010).
5. Job satisfaction (JS) as an outcome captures both objective and subjective aspects of jobs including employees’ aspirations and expectations. Traditionally, JS has been regarded as an important predictor of labour market behaviour such as quits and absenteeism (Akerlof et al., 1988; Clark et al., 1998; Hamermesh, 2001; Levy-Garboua et al., 2007), job performance and productivity (Iaffaldano and Muchinsky, 1985; Layard, 2013; Oswald et al., 2015), organisational performance (Bryson et al., 2017; Ostroff, 1992), and even physical health (Layard, 2013), among others (see Haile, 2017; Perales and Tomaszewski, 2016, for recent studies).
6. We make the reasonable assumption that if a health condition is reported to limit one’s day-to-day activities, the condition must also limit one’s work activities. Distinguishing between those whose health condition limits their day-to-day activities ‘a little’ and ‘a lot’ is not feasible empirically given that only 1.3% of all respondents in the original sample reported that the health condition limits their day-to-day activities ‘a lot’, which drops further in the final sample.
7. The weights we use in our workplace-level analysis are workplace weights, which would not address this higher likelihood of non-response/non-participation.
8. Bryson et al. (2017) and Perales and Tomaszewski (2016) have used a similar disaggregation.
9. All Appendix tables are available as separate files online.
10. Summary statistics on the full range of outcome and control variables are provided as an Appendix table online.
11. SUR regression also provides some efficiency gain from combining the two equations. Another advantage of the model is that it permits conducting joint test(s) of significance on the coefficients of interest from the two equations straightforwardly.

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