

UK Working lives

The CIPD Job Quality Index



The CIPD is the professional body for HR and people development. The not-for-profit organisation champions better work and working lives and has been setting the benchmark for excellence in people and organisation development for more than 100 years. It has more than 145,000 members across the world, provides thought leadership through independent research on the world of work, and offers professional training and accreditation for those working in HR and learning and development.

UK Working Lives

Appendix 2: methodology

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Introduction

The CIPD's meaningfulness is to champion better work and working lives by improving practices in people and organisation development, for the benefit of individuals, businesses, economies and society. We've been surveying UK working life since 2009, in the form of the *Employee Outlook*, which has become a key reference point for employers, academics and policy-makers.

In 2017 we worked with the Institute for Employment Research (IER) at Warwick University and with Manchester Alliance Business School to develop our thinking of what comprises good work or job quality and how employees can influence it. This work – in particular that of the IER on the nature and dimensions of job quality and how they are measured – informed the development of the *Employee Outlook* into *UK Working Lives*, a survey focused squarely on job quality. We aim to measure the key dimensions of job quality in a way that is reasonably comprehensive and concise, and assess this at a UK level annually.

UK Working Lives is a survey of UK employees launched in 2018. It builds on previous surveys, including by the CIPD and others, to apply a new Job Quality Index with the aim of encapsulating and assessing the quality of UK jobs today.

This appendix to the *UK Working Lives 2018* survey report describes the method of our survey (section 1), our approach to conceptualising and measuring job quality (section 2), the composition of our measures of the seven dimensions of job quality (section 3) and how we computed indices for these seven dimensions (section 4).

Separately in Appendix 1 we present the top-line results from the survey and analysis of the Job Quality Index. Survey documents are available at www.cipd.co.uk/workinglives. If you are interested in replicating the survey, the full questionnaire is available upon request from research@cipd.co.uk.

1 Survey method

UK Working Lives (UKWL) is a survey of approximately 6,000 UK workers conducted by YouGov using its UK panel of approximately 350,000 adults in work. Respondents were targeted using quota and the data was weighted to give a sample that is representative of the UK workforce in terms of: gender and whether workers are part-time or full-time; sector and organisation size; and industry type. Size of organisation was classified in the following way: sole trader (one-person business), micro business (2–9), small business (10–49), medium (50–249) and large (more than 250).

The survey was run from December 2017 to January 2018 using a self-completion online questionnaire. Emails were sent to panellists selected at random from the base sample. The email invited them to take part in a survey and provided a generic survey link. Once a panel member clicked on the link, they were sent to the survey that they were most required for, according to the sample definition and quotas.

Following screener questions, the job quality component of the survey contained 49 questions, a number of which included multiple items and typically took respondents slightly over 15 minutes to complete. We also draw on other variables that YouGov hold on their respondents and update as a matter of course every six months.

Various sources survey UK employees about job quality. In particular, the Workplace Employment Relations Study (WERS), the Skills and Employment Survey (UK SES) and the

Labour Force Survey (LFS) act as central reference points on many matters. There are strengths and limitations in all these sources, including UKWL. For example, WERS has a robust sample that is representative of UK workplaces, good detail and breadth of topics covered, and a very large sample size, but has been infrequent. SES has similar advantages and disadvantages, but with a smaller sample size and thus less capacity for comparisons between industries, for example. LFS has a robust sample, very large sample size and frequency, but lacks detail and breadth in many aspects of job quality. UKWL has good detail and breadth, is frequent, but is based on a less robust sample (being a non-probability sample) and has a smaller sample size than WERS and LFS.

Assuming that it is prohibitively expensive to obtain data on job quality that meets all these criteria – robustly representative, detailed and broad in scope, large in sample size and frequent – the key must be to piece together complementing data sources. As such, the UKWL data makes a valuable contribution alongside other sources. The current survey offers greater breadth in some aspects of job quality than has been measured by single UK surveys previously, and future surveys will add valuable trend data on this.

2 A seven-dimension model

Building on our review of the concepts and measurement of job quality (Warhurst et al 2017), we identify seven dimensions of job quality that cover both work and employment.

Drawing on the work of Muñoz de Bustillo et al (2011) based on the European Working Conditions Survey, and previous work by Warhurst et al (2017), the review identified six dimensions, one of which was ‘intrinsic characteristics of work’. This dimension was too broad for the needs of the current survey, given our particular interest in both the work that people carry out and the relationships and social environment in which this happens. We

Table 1: Seven dimensions of job quality

Dimension of job quality	Areas included
1 Pay and benefits	Pay as a percentile and in relation to the Living Wage, employer pension contributions and other employee benefits.
2 Terms of employment	Contract type, underemployment, job security and development opportunities provided.
3 Job design and the nature of work	Workload or work intensity, how empowered people are in their jobs, how well resourced they are to carry out their work, job complexity and how well this matches the person’s skills and qualifications, and how meaningful people find their work.
4 Social support and cohesion	The quality of relationships at work, psychological safety and the quality of people management.
5 Health and well-being	Positive and negative impacts of work on physical and mental health.
6 Work–life balance	Overwork, commuting time, how much work encroaches on personal life and vice versa, and HR provision for flexible working.
7 Voice and representation	Channels for feeding views to senior management, cultural norms on voice, and satisfaction with the opportunities for voice.

thus split it into two parts: first, the nature of work itself and how jobs are designed; and second, the relational aspects of work, in particular social support and cohesion. This leaves us with seven dimensions, summarised in Table 1.

3 Approach to constructing indices

This section describes our broad methodology for constructing multi-dimensional job quality indices for the 2018 *UK Working Lives* (UKWL) survey. In the following section, we describe the compositions of the specific indices.

Subjective and objective measures

It is important to recognise that within the dimensions of job quality, there are some aspects of job quality that are inherently objective – that is, what is good for one person will be good for anyone – and some that are subjective, depending on the person's preferences, situation, or stage of life.

For example, no one would contest that more pay is better than less pay, but the effects of part-time work and irregular hours are far less clear as they are likely to vary with one's life stage (Warhurst et al 2017, Adler and Adler 2004, Knox et al 2015, Vanselow et al 2010). The same part-time job may be a poor offer for someone who is trying to feed a family or tie down a mortgage as a first-time buyer, yet ideal for a student who cannot commit full-time, or an older worker who has paid off their mortgage and seen their dependants leave home. Further, there are some aspects of work – such as finding work meaningful – that we would agree are good, but which will vary in nature and importance according to people's personalities or belief systems.

To account for all these aspects, we set out to describe measures of job quality that account for both objective standards that are fairly universal – or at least, consistent within a national context – and relative assessments that are essentially a question of person–job match.

Multi-dimensional job quality indices

All the indices are produced through a standardised procedure.

In the first step, all relevant questions are recoded into positive outcomes and given scores by subjective judgement. The responses are recoded on a 0 to 1 scale, 0 representing worst quality and 1 being the best in the respective indicator. The middle values are replaced depending on the scale. As most of the questions which are used to construct the indices were asked to respond on a scale 1 to 5, we recode them in the following way: 1, 0.75, 0.5, 0.25 and 0.

In the second step, we simply average the non-missing scores as derived in the above step over all components to arrive at the index score for that dimension or sub-dimension. Before arriving at the final index, we perform the analysis of consistency and reliability checking of the items used to construct the index.

Internal consistency of indices

In order to measure the internal consistency of the task indices, we use the following statistics: the inter-item correlations within each index, the closely related Cronbach's Alpha, which is a measure of scale reliability, and, where needed, principal component factor analysis.

The idea behind looking at inter-item correlations is simple: once we have recoded all the questions such that 'more represents better' in all questions, the directions of correlation between all the items should in general be positive. For example, if using a computer every day and writing emails are both core aspects of technology use at work, we would usually expect these to be positively correlated. We do not select the items initially depending on the positive correlation but we do look at the inter-item association (along with other statistics) to retain meaningful items for an index.

The Cronbach's Alpha is a commonly used measure of scale reliability for scales composed of scores on individual items in a list of indicators. The reliability statistic (α) is defined as the square of correlation between the measured scale and the underlying factor. The statistic α is often thought of as an indicator of whether the different items in the scale are measuring the same latent variable. If all items are perfectly reliable and measure the same thing (true score), the coefficient alpha is equal to 1. In general, a standard value of 0.7 is used as a criteria to see if a scale is reliable or not.

Principal component factor (PCF) analysis is a factor analysis tool and statistical technique for data reduction. It reduces the number of variables or components by performing a factor analysis and helps us to retain the most meaningful components. It is particularly useful when there are many dimensions or components and graphical representation is not possible to see the association between the dimensions. This technique has been very useful in creating multi-dimensional indices.

It is important to note that, while we test the reliability and inter-item correlations for the different indices, this can be for information only. Low scores in these measures do not always prevent us from computing the indices; we can override this consideration for theoretical reasons. For example, we find very small correlations between our sub-indices for whether representatives have employee representation and for the management culture on employee voice (that is, managerial openness to employee views). This should not be surprising, as workplaces where trade unions are present are typically different in many respects from those that do not – including in organisation size and sector, and thus in employee relations culture. Nonetheless, both these components are important aspects of employee voice, so we justify amalgamating them into an index on these grounds, rather than on the grounds that they measure similar things.

However, in cases where we have poor reliability and weak correlations between items that are clearly designed to measure similar things – for example in the job complexity sub-index, how 'interesting' and a reversed item of how 'monotonous' one's work is – then we adjust the components of the index accordingly.

A single measurement of job quality

Each of the seven dimensions were judged to be sufficiently cohesive areas in their own right, which is to say that meaningfully combining measures to compute seven sub-indices was a realistic prospect. However, distilling this further into a single overarching index of job quality was not judged to be useful, as it could lead to conflation of very different components.

Our approach of computing indices at the level of dimensions also has other advantages. First, not combining into a single overarching index means that we avoid the need to weight different indices, as some of them will be more consequential than others.

Second, it allows us to sidestep debates of what is a core component of job quality and what is a closely related but distinct factor. In particular, well-being can be seen as either a component of job quality or an outcome of it, and employee voice can be seen either as a component of job quality or an antecedent or driver (that is, something that influences job

quality). By not computing a single overall index for job quality, we can proceed to develop useful metrics without resolving these issues definitively. We note that they may sit at slightly different points in the impact chain or theory of change and use them all as important measures relating to job quality.

4 Composition of the Job Quality Index

In this section we describe the compositions of the specific indices for the seven dimensions of job quality, including the internal consistency and reliability of various indicators.

Apart from measuring the seven core dimensions of job quality, the survey also collects information on demographic characteristics, and other related aspects such as work engagement, life satisfaction and financial situation. Tables of these and all main questions in the survey can be seen in Appendix 1 at www.cipd.co.uk/workinglives.

Pay and benefits index

Our pay and benefits index consists of three components: a pay sub-index (objective measures); a pension sub-index; and a benefits sub-index. We assign different weighting to each of these sub-indices based on expert views of their relative importance. The pay sub-index is given the highest weighting of 75%, with the pension sub-index assigned 15% and the benefits sub-index 10% of the weighting respectively.

Subjective pay measure

A subjective measure of pay is important because what may constitute good pay for one person in one job may be considered poor elsewhere. Thus, we look at people's perceptions of their pay, asking whether it is 'appropriate' given their responsibilities and achievements in their job. This is a similar but more relevant measure than satisfaction with pay, which may be swayed more by individuals' aspirations than their view of how well and fairly they are currently paid.

Although the measure of pay appropriateness is useful, it has limitations. Evidence from behavioural science shows that pay has a strongly social context, in that we look not only at our individual need but also make comparisons with our peers; so highly paid workers may feel underpaid when they see colleagues being paid more (Lupton et al 2015). Moreover, people are inherently biased in gauging whether they are paid well, tending to overestimate their own skills and market value in what is termed 'endowment bias' (ibid) or the 'above average effect' (Kahneman 2011).

Our other measures of pay and benefits are objective, so to avoid conflation we exclude our subjective measure of pay appropriateness from the index.

Objective pay sub-index

Within the objective pay sub-index, 50% is based on pay as a percentile and 50% as multiples of the Living Wage.

We ask respondents what their annual salary is; or if they don't know this, their hourly, weekly, fortnightly or monthly pay. From this and the number of hours they usually work in a week, we calculate workers' effective hourly rate including any unpaid overtime. To calculate hourly pay from ASHE data on weekly pay we assume a full-time job is 39 hours per week, this being the mean total paid hours per week in the ASHE 2017 data. We also assume a five-day week (for weekly pay), 4.2 weeks per month (for monthly pay) and 52 weeks per year (for yearly pay).

Our figures are broadly in line with data from the Annual Survey of Hours and Earnings (ASHE) conducted by the Office for National Statistics (2017), although our data has a greater spread, with more low-wage workers (the bottom 10% of earners on £6.48 per hour or less, compared with the ASHE data of £7.92) and more high-wage workers (the top 10% of earners on £30.59 per hour, compared with the ASHE data of £27.12).

Having generated one hourly pay variable, we score this according to Table 2. We then create pay percentiles following the Annual Survey of Hours and Earnings (ASHE) – Office for National Statistics, which we use as a score of 1 to 100.

We average the non-missing scores of these to create the objective pay sub-index. The measures of pay percentile and pay relative to Living Wage correlate very highly (0.92). The Cronbach’s alpha statistic is equal to 0.96.

Table 2: Pay relative to living wage (2017 rate)

Category		£ hourly pay London		£ hourly pay non-London	Score
< National Living Wage (25+ yrs; April 2017 – March 2018)	<	£7.50	<	£7.50	0
NLW but < real Living Wage	<	£10.20	<	£8.75	25
Real LW but < 2x real LW	<	£20.40	<	£17.50	50
2x real LW but < 3x real LW	<	£30.60	<	£26.25	75
3x real LW or more	>=	£30.60	>=	£26.25	100

Pensions sub-index

We create a pensions sub-index based on the employer contribution as a percentage of salary. We recode the employer’s contribution to an employee’s pensions for those who reported saving through a company pension plan. Those who reported to not have a company pension plan are scored zero.

Table 3: Employer contribution to pension as a proportion of salary

Contribution	Score
0%	0
1%	16.7
2–3%	33.3
4–6%	50
7–10%	66.7
11–15%	83.3
16% or more	100

Benefits sub-index

This index is created by simply counting the number of benefits an employee receives from the employer from a list of nine items (for example transport benefits). Each item generates a score of 100 (available) or 0 (unavailable) and these scores are averaged to create the sub-index.

Pay and benefits index

The overall pay and benefits index is derived as a weighted average of the objective pay, pensions and benefits sub-indices. The pay and benefits index is created by weighting the three sub-indices by 75%, 15% and 10% of weighting respectively and summing the non-missing scores of above-mentioned components to arrive at the final index score.

We check the pairwise correlation and their internal consistency. The three sub-indices used to create the pay and benefits index are moderately correlated. The alpha scale reliability score is 0.64, slightly lower than the standard score.

Table 4: Summary of the pay and benefits index

Observations	Mean	Standard deviation (SD)	Min	Max
5,910	0.394545	0.285172	0	0.99

Table 5: Correlations for pay and benefits sub-indices

	pay_index	pension_index	benefit_index
pay_index	1		
pension_index	0.3796	1	
benefit_index	0.3231	0.4476	1

Terms of employment index

To create this index we create and compile three sub-indices on job stability (for example contractual), under-employment and development opportunities.

Job security sub-index

We score three components of job security: whether the job contract is permanent (yes = 100; no = 0); perceived likelihood of losing one’s job (very likely = 0; likely = 25; neither likely nor unlikely = 50; unlikely = 75; very unlikely = 100); and how often people are required to work at short notice (once a week or less = 0; two or three times a month = 25; once a month = 50; once every two to three months = 75; twice a year or less often = 100).

The correlation coefficients reveal that the indicators selected for this sub-index are not strongly related to each other. The Cronbach’s α statistic is also very low (0.27), implying a weak scale reliability. Nonetheless, we use these indicators on the basis that they measure different aspects of job security. To compute the sub-index, we average the non-missing scores of these components.

Table 6: Correlations within job security sub-index

	Permanent	Lose job	Short notice
Permanent	1		
Lose job	0.1085	1	
Short notice	0.1498	0.085	1

Under-employment sub-index

We calculate under-employment by subtracting the hours that respondents would like to work per week from the hours they actually work. We recode any hours overworked as zero, because the problem of some employees being overworked does not balance out the problem of under-employment among others. Those who have 0 hours’ difference – that is, they actually work the hours they wish to work – score highest in the index. On average individuals would like to work fewer hours (at least six hours less) in a week than the hours they actually work.

Table 7: Under-employment calculation

Hours under-employed	Percentile	Score
0		100

Over 0, less than or equal to 5	Below 25th percentile	75
Over 5, less than or equal to 14	25th to 75th percentile	50
Over 14, less than or equal to 23	75th to 90th percentile	25
Over 23	90th percentile or above	0

Development sub-index

Two subjective questions are used to create an aggregated sub-index for development and career opportunities within respondents' jobs. The response options for both items are scored: strongly agree = 100; agree = 75; neither agree nor disagree = 50, disagree = 25; strongly disagree = 0.

The indicators selected for the sub-index *Development* are strongly correlated to each other. The Cronbach's α statistic is also very high (0.82), implying a very strong scale reliability.

Terms of employment index

The terms of employment index is created using the same method, averaging the non-missing scores of above-mentioned components to arrive at the index score.

The three sub-indices used for terms of employment index are weakly correlated. The alpha scale reliability score is 0.32, much lower than the standard score. However, we aggregate these sub-indices on the basis that they measure distinct yet important aspects of terms of a heterogeneous aspect of job quality. In short, we need not expect them to be highly correlated to each other.

Table 8: Summary of the terms of employment index

Observations	Mean	SD	Min	Max
5,910	0.74144	0.143346	0.055556	1

Table 9: Correlations within terms of employment index

	Job security	Under-employment	Development
Job security	1		
Under-employment	0.1876	1	
Development	0.1582	0.0854	1

Nature of work index

Our index for job design and the nature of work consists of three components: job demands and the resources available to employees to fulfil them, meaningfulness of work, and skills. All three components are given equal weight in the index.

Demand and resources sub-index

This sub-index has three components. Job demand is measured through a single question on workload in a normal week (far too much = 0; too much = 25; about right = 100; too little = 0; far too little = 0). Job autonomy is measured through four items on the extent of influence respondents have over what tasks they do, how fast they work, how they work, and when they start and finish work (a lot = 100; some = 66.7; a little = 33.3; none = 0). Job resources are measured by three indicators on whether respondents have enough time, the right equipment, and a suitable space to do their work (strongly agree = 100; agree = 75; neither agree nor disagree = 50, disagree = 25; strongly disagree = 0).

We check the correlation and consistency between these autonomy and resources measures. The correlation matrix shows that the autonomy indicators are positively

correlated to each other and the alpha scale reliability is also very high at 0.83. For job resources, the correlation matrix shows moderate positive associations and the Cronbach's alpha statistic is adequate at 0.70.

Having generated scores for workload, autonomy and resources, we average the non-missing values of the three sub-indices to create a demand and resources sub-index. We check the internal consistency of the demand and resources sub-index. Though positive, *autonomy* is weakly correlated with *workload*. However, dropping one of them merely improves the alpha score from 0.52 to 0.55.

Table 10: Correlations between autonomy items

	autonomy 1	autonomy 2	autonomy 3	autonomy 4
autonomy 1	1			
autonomy 2	0.607	1		
autonomy 3	0.6478	0.6517	1	
autonomy 4	0.4907	0.4973	0.4874	1

Table 11: Correlations between resource items

	resource 1	resource 2	resource 3
resource 1	1		
resource 2	0.4032	1	
resource 3	0.3598	0.5882	1

Table 12: Correlations within demand and resources sub-index

	workload_index	autonom_index	resource_index
workload_index	1		
autonom_index	0.1391	1	
resource_index	0.3749	0.3304	1

Meaningfulness sub-index

We create a sub-index for the meaningfulness of work using a set of three subjective questions on respondents' perceived usefulness of their work and motivation for the work. The response options for each items are recoded: strongly agree = 100; agree = 75; neither agree nor disagree = 50, disagree = 25; strongly disagree = 0.

The indicators are internally consistent and show strong positive correlation with 0.78 alpha score. We average the non-missing values of these three indicators to create an aggregated sub-index for the meaningfulness of work.

Table 13: Correlations of meaningfulness items

	meaningfulness 1	meaningfulness 2	meaningfulness 3
meaningfulness 1	1		
meaningfulness 2	0.4933	1	
meaningfulness 3	0.6078	0.5601	1

Skills sub-index

This index is created by looking at the suitability of respondents' qualifications and skills for their job. Qualification and skill match is measured using employees' self-assessment on whether or not they are appropriately qualified and skilled in terms of job-requirement. Over-qualified/over-skilled is scored 0, the right level of qualifications/skills is scored 100, and under-qualified/under-skilled is scored 0.

The two items have a moderate positive correlation of 0.42. The scale reliability coefficient is 0.59, lower than the rule-of-thumb score, 0.70. The skills sub-index is formed by taking an average of the two items.

Nature of work index

We construct an overarching index for job design and the nature of work. This follows the same procedure of averaging the non-missing scores of the above sub-indices (demand and resources, meaningfulness, and skills).

The correlation matrix shows that three items are not strongly correlated. The Cronbach's alpha statistic is equal to 0.39, much lower than the accepted value. However, dropping any of the items from the list does not improve the alpha statistic.

Table 14: Correlations within nature of work index

	Demand and resources	Meaningfulness	Skills
Demand and resources	1		
Meaningfulness	0.289	1	
Skills	0.1742	0.1779	1

Table 15: Summary of the nature of work index

Observations	Mean	SD	Min	Max
5,907	0.610151	0.208251	0	1

Job complexity index

We consider job complexity an aspect of the nature of work. However, we decide to measure it separately from skills because of internal inconsistency of the indicators. To measure complexity of a job we use a battery of five indicators asking how often do respondents' jobs involve tasks that are complex, interesting and so on.

Table 16: Correlations between job complexity items

	Problem-solving	Complex tasks	Learn new things	Interesting tasks	Monotonous tasks
Problem-solving	1				
Complex tasks	0.565	1			
Learn new things	0.4501	0.5652	1		
Interesting tasks	0.4198	0.5368	0.6146	1	
Monotonous tasks	0.0831	0.1818	0.2394	0.3879	1

Overall the correlation matrix looks good and the alpha score is high enough at 0.78. An item asking about ‘monotonous tasks’ is the only one poorly correlated with all other task indicators. Excluding this item improves the alpha score substantially to 0.82. Additionally, factor analysis also shows that the ‘monotonous’ variable has much higher uniqueness compared with all other variables. Thus, we remove it from the aggregated job complexity index. We create the job complexity index by averaging the non-missing values of the remaining four items.

Table 17: Factor analysis loadings for job complexity items

Variable	Factor loading	Uniqueness
Problem-solving	0.7117	0.4935
Complex tasks	0.8144	0.3368
Learn new things	0.8175	0.3318
Interesting tasks	0.8254	0.3187
Monotonous tasks	0.4253	0.8191

Table 18: Summary of job complexity index

Observations	Mean	SD	Min	Max
5,910	0.610903	0.187992	0	1

Social support and cohesion index

This dimension consists of three components: relationships with line manager, colleagues and clients and others; psychological safety, or how able people feel to take risk; and quality of line management. All three components are given equal weight in the index.

Relationship sub-index

A battery of seven indicators is used to create an aggregated sub-index score of relationships at work. This sub-index is measured only for employees who work in a firm with more than two employees.

The question asks respondents how good their relationships are with seven groups of people (for example line manager or supervisor; colleagues in your team); each indicator depends on the respondent having a relationship with the specified person or group of people. Each item is scored: very good = 100; good = 75; neither good nor poor = 50; poor = 25; very poor = 0. The correlation coefficients are high to moderate and the alpha reliability score is high enough at 0.84. We average the non-missing values of the seven indicators to create the relationship sub-index.

Table 19: Correlations within relationship sub-index

	reln 1	reln 2	reln 3	reln 4	reln 5	reln 6	reln 7
relationship 1	1						
relationship 2	0.5424	1					
relationship 3	0.4169	0.464	1				
relationship 4	0.3584	0.5261	0.6742	1			
relationship 5	0.3377	0.4417	0.7322	0.6135	1		
relationship 6	0.2705	0.3451	0.4364	0.4809	0.5138	1	
relationship 7	0.236	0.3638	0.3937	0.4931	0.4518	0.6289	1

Psychological safety sub-index

Psychological safety refers to whether people feel able to take risks within a team (Edmondson 1999) and can be viewed as whether there is a blame culture or some 'mistake tolerance'.

A battery of three indicators is used to create an aggregated index score for psychological safety at work. Response options for one item are scored: strongly agree = 100; agree = 75; neither agree nor disagree = 50, disagree = 25; strongly disagree = 0. For the other two negatively worded items, this is reversed. The correlation coefficients across the items are high to moderate and the alpha reliability score is high enough at 0.62. We average the non-missing values of the seven indicators to create a sub-index.

Table 20: Correlations within psychological safety sub-index

	psych. safety 1	psych. safety 2	psych. safety 3
psych. safety 1	1		
psych. safety 2	0.3773	1	
psych. safety 3	0.2762	0.4103	1

Line management sub-index

This sub-dimension focuses on the different aspects of the relationship between an employee and their line manager or immediate boss. We use a battery of nine indicators which capture all the different aspects and aggregate them into a line management sub-index. The response options for each are scored: strongly agree = 100; agree = 75; neither agree nor disagree = 50, disagree = 25; strongly disagree = 0.

We check the correlation and consistency of the indicators. The items show strong positive correlation with each other. The alpha reliability score is also very high at 0.95. We take the average of non-missing values of the indicators to create the line management index.

Table 21: Correlations within line management sub-index

	resp.	recog.	team.	helpf.	feedb.	devt.	relia.	supp.	fair
respect	1								
recognition	0.7311	1							
teamwork	0.6622	0.6699	1						
helpful	0.6764	0.6789	0.702	1					
feedback	0.634	0.7124	0.7001	0.7047	1				
develops	0.6381	0.6551	0.6848	0.6894	0.7037	1			
reliable	0.6995	0.6724	0.7237	0.712	0.6886	0.6684	1		
support	0.759	0.7097	0.6976	0.7251	0.6587	0.6743	0.732	1	
fair	0.8026	0.7096	0.6738	0.6818	0.6415	0.6424	0.7183	0.7657	1

Social support and cohesion index

Construction of an overall social support and cohesion index follows the same procedure of averaging the non-missing scores of the three sub-indices. The correlation matrix shows that three items have moderate positive correlation with each other. The Cronbach's alpha statistic is equal to 0.76, higher than the accepted value.

Table 22: Correlations within social support and cohesion index

	relationship	psych safety	line management
relationships	1		
psychological safety	0.5046	1	
line management	0.5789	0.5375	1

Table 23: Summary of the social support and cohesion index

Obs	Mean	SD	Min	Max
5,110	0.7003	0.166638	0	1

Health and well-being index

This dimension consists of two equally weighted components: physical health and mental health.

Physical health sub-index

This sub-index comprises three items: first, a subjective measure of how work affects respondents' physical health (very positively = 100; positively = 75; neither positively nor negatively = 50; negatively = 25; very negatively = 0); second, an objective measure of which work-related health problems respondents have had in the last year from a list of seven physical conditions (no problems = 100; one problem = 25; more than one problem = 0); third, a measure of how energetic or exhausted respondents feel at work (for *energetic*, always = 100; often = 75; sometimes = 50; rarely = 25; never = 0; for *exhausted*, this is reversed).

The correlation coefficient of the two subjective measures is higher than the correlation coefficients of the objective measure. Scale reliability coefficient is 0.50, lower than the normally accepted value.

Table 24: Correlations within physical health sub-index

	physical health	health problems	energy
physical health	1		
health problems	0.2602	1	
energy	0.4648	0.2572	1

Mental health sub-index

We measure mental health by aggregating responses from four measures. First is a subjective measure of how work affects respondents' mental health (scored as per the first physical health item). We then have two measures of how often people feel 'miserable' or 'under excessive pressure' at work (scored as per the *exhausted* item), the latter of which reflects the Health and Safety Executive's (2005) definition of stress. Finally, we include an objective indicator of whether respondents have suffered work-related anxiety or depression in the last year (no = 100; yes = 0).

The items have moderate positive correlation and the scale reliability coefficient is 0.70, which is sufficient. We average the non-missing values of these items to create the mental health sub-index.

Table 25: Correlations within mental health sub-index

	mental health	miserable	stressed	anxiety or depression
mental health	1			
miserable	0.5227	1		
stressed	0.3843	0.4699	1	
anxiety or depression	0.4228	0.3488	0.3021	1

Health and well-being index

Construction of a health and well-being index follows the same procedure of averaging the non-missing scores of the two sub-indices for physical and mental health. The sub-indices have a correlation coefficient of 0.56 and the Cronbach’s alpha statistic is equal to 0.72, slightly higher than the accepted score.

Table 26: Summary of the health and well-being index

Observations	Mean	SD	Min	Max
5,910	0.607064	0.182535	0	1

Work–life balance index

This dimension consists of three equally weighted components: balance (maintaining professional and personal life); HR practice; and hours (commute time and overwork time).

Achieved work–life balance sub-index

A battery of three items is used to measure an index score for how well respondents actually manage to balance work and personal life, covering: whether work encroaches on personal life, whether personal life encroaches on work, and whether respondents find it hard to relax in personal time because of work. Items are scored: strongly agree = 0; agree = 25; neither agree nor disagree = 50; disagree = 75; strongly disagree = 100.

The items are consistent with each other with moderate to high positive correlation coefficients, and 0.714 alpha reliability score (adequate). The items are then averaged over non-missing values to generate the sub-index.

Table 27: Achieved work–life balance

	wlb_1_in	wlb_2_in	wlb_3_in
wlb_1_in	1		
wlb_2_in	0.366	1	
wlb_3_in	0.6331	0.3439	1

Human resource (HR) practices sub-index

We include two items in this sub-index on how well HR policies and practices support work–life balance: first, how easy it is for respondents to informally take time off (very easy = 100; fairly easy = 75; neither easy nor difficult = 50; fairly difficult = 25; very difficult = 0); and second, whether six HR practices (for example, flexi-time) are available (each being scored: available = 100; not available = 0).

Hours overworked sub-index

This index captures the time spent on work and on commuting. UKWL has questions on number of hours usually spent on paid work and the number of hours the person would like to work. We use both the questions to calculate the number of hours a person overworks in a week. We also add the weekly commuting time to the hours overworked, giving a single figure of typical weekly hours. The hour index is created by recoding the hours overworked in a scale thus: 0 hours = 100; 0.1 to 5 hours = 75; 5.01 to 10 hours = 50; 10.01 to 15 hours = 25; 15.01 hours or more = 0.

Work–life balance index

An index for work–life balance is created by averaging the non-missing values of the sub-indices for achieved balance, HR practices, and hours overworked and commuting. The correlation matrix shows positive and moderate correlation between the three sub-indices. Scale reliability coefficient is 0.4608.

Table 28: Correlations within work–life balance index

	achieved balance	HR practices	hours over
achieved balance	1		
HR practices	0.3281	1	
hours over	0.2681	0.1723	1

Table 29: Summary of the work–life balance index

Obs	Mean	SD	Min	Max
5,910	0.579406	0.214827	0	1

Employee voice index

Our index for employee voice has three components: direct channels, indirect channels, and management culture regarding voice. The final index is a weighted average of these three sub-indices: we assign 50% weighting to channels (25% to the first component, 25% to the second) and 50% to the third component.

Direct channels sub-index

A sub-index for direct channels for employee voice is created by counting the number of channels available in the workplace. We present a list of six channels, including employee survey, online forum or chat, employee focus groups and one-to-one meetings with managers (for each, no = 0; yes = 100; total is averaged).

Indirect channel sub-index

We create a sub-index for indirect channels for voice based on two batteries of questions. First, we have two items on whether the respondent’s workplace has a trade union and whether there is a non-union form of employee representation (for each, no = 0; yes = 100; total is averaged). Second, for those who have either form of representation, we have a battery of three questions on how well their reps seek employee views, represent employee views and keep employees informed (for each, very good = 100; good = 75; neither good nor poor = 50; poor = 25; very poor = 0; results averaged).

Management culture sub-index

The sub-index of management culture on employee voice is derived from a battery of three questions on how well managers at the workplace seek employee views, respond to employee suggestions, and allow employees to influence decisions (scores as for quality of employee representatives).

Employee voice index

We check the correlations of the three sub-indices and their scale reliability. The management culture sub-index is poorly correlated with the indirect channels sub-index. Alpha scale reliability score is also very low at 0.43. Nonetheless we compute the index on the basis that these are distinct but important components of employee voice.

Table 30: Correlations within the employee voice index

	direct channels	indirect channels	management culture
direct channels	1		
indirect channels	0.3379	1	
management culture	0.2033	0.0406	1

Table 31: Summary of the employee voice index

Observations	Mean	SD	Min	Max
5,910	0.280193	0.219551	0	1

References

ADLER, P. and ADLER, P. (2004) *Paradise laborers*. Ithaca, NY: Cornell University Press.

EDMONDSON, A. (1999) Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*. Vol 44. pp350–83.

HSE. (2005) *Working together to reduce stress at work: a guide for employees*. Sudbury: HSE Books. Available at: www.hse.gov.uk/pubns/indg424.pdf

KAHNEMAN, D. (2011) *Thinking, fast and slow*. London: Penguin.

KNOX, A., WARHURST, C., NICKSON, D. and DUTTON, E. (2015) More than a feeling: using hotel room attendants to improve understanding of job quality. *International Journal of Human Resource Management*. Vol 26, No 12. pp1547–67.

LUPTON, B., ROWE, A. and WHITTLE, R. (2015) *Show me the money! The behavioural science of reward*. London: Chartered Institute of Personnel and Development. Available at: www.cipd.co.uk/knowledge/culture/behaviour/reward-report [Accessed 20 March 2018].

MUÑOZ DE BUSTILLO, R., FERNÁNDEZ-MACÍAS, E., ANTÓN, J.-I. and ESTEVE, F. (2011) *Measuring more than money: the social economics of job quality*. Cheltenham: Edward Elgar.

ONS. (2017) *Annual survey of hours and earnings: 2016 provisional results: year-on-year change to the distribution of full-time gross weekly earnings relative to the year-on-year change in the median, UK, 1997–2016*. London: Office for National Statistics. Data available at:

www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/annualsurveyofhoursandearnings/2016provisionalresults#distribution-of-earnings

VANSELOW, A., WARHURST, C., BERNHARDT, A. and DRESSER, L. (2010) Working at the wage floor: hotel room attendants and labor market institutions in Europe and the United

States. In: GAUTIÉ, J. and SCHMITT, J. (eds) *Low wage work in a wealthy world*. New York: Russell Sage Foundation.

WARHURST, C., WRIGHT, S. and LYONETTE, C. (2017) *Understanding and measuring job quality: Part 1 – Thematic literature review*. London: Chartered Institute of Personnel and Development. Available at: www.cipd.co.uk/knowledge/work/job-quality-value-creation/measuring-job-quality-report

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