IMPLICATIONS OF WORK EFFORT AND DISCRETION FOR EMPLOYEE WELL-BEING AND CAREER-RELATED OUTCOMES: AN INTEGRATIVE ASSESSMENT*

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Abstract

How does work effort affect employee outcomes? The authors bridge distinct literatures on the well-being versus career-related implications of work effort by analyzing the relation of overtime work and work intensity to both types of outcomes. They also extend examination of the role of discretion in modifying the effects of work effort from well-being to career-related outcomes. Using data from the fifth and sixth European Working Conditions Surveys, the authors show that greater work effort relates strongly to reduced well-being and modestly to inferior career-related outcomes, while discretion may attenuate these adverse implications. Even with discretion, work intensity generally is a stronger predictor of unfavorable outcomes than overtime work. Implications include the need for employees to become aware of the broader limitations of excessive work effort, for employers to give discretion when viable, and for public policy to devise strategies that help limit the adverse consequences of work intensity.

In 2016, over five million UK employees reported regularly working unpaid overtime (Trades Union Congress 2017), while about 36 percent of Dutch employees reported often or always working at a high pace (CBS 2017). Figures such as these exemplify a tendency of many employees to supply high levels of work effort on a frequent basis. A fundamental question is how work effort is related to individual consequences, both in terms of employee well-being as well as career-related outcomes. Answers to this question are important because they may inform employees' labor supply decisions and they can assist employers and governments in designing strategies that stimulate productive and sustainable effort in the workforce.

Work effort includes "overtime work" and "work intensity", where the former is the amount of time an employee works in excess of normal hours, while the latter is the level of effort supplied per unit of working time. A broad and multidisciplinary literature has studied the well-being consequences of both types of work effort, while a small and separate literature in economics has focused on overtime work and its career-related implications. Our first objective is to bridge these literatures by offering an integrative analysis of the implications of overtime work and work intensity for employee well-being and career-related outcomes. Our second objective is to examine how the level of discretion given to employees influences the relationship between work effort and employee outcomes, where "discretion" means the freedom to decide how and when to carry out the work. We do so in the spirit of the 'job demands-control model' (Karasek 1979), which suggests that a focus on work effort (often referred to as 'job demands') is truncated without simultaneous attention to the discretion afforded to employees. The intuition is that discretion serves as a buffer that can alleviate the possibly adverse implications of work effort for employee well-being. Here, we extend this idea of an interaction between work effort and discretion by using it not just to predict well-being but also career-related outcomes, a relation thus far underemphasized in the literature.

We use micro data on a random sample of 51,895 employees from across 36 European countries, drawn from the fifth and sixth European Working Conditions Surveys (Eurofound 2010, 2015). Our data set covers all industries and occupations and contains detailed information on types of work effort, types of discretion, and indicators of well-being and career-related outcomes. We estimate models using overtime work and work intensity, as well as interactions with types of discretion, to predict indicators of well-being (i.e., stress, fatigue, and job satisfaction) and career-related outcomes (i.e., career prospects, job security, and recognition). We control for a wide range of factors that may determine both work effort and discretion as well as employee consequences, and our results hold up across alternative model specifications. In subsample analyses, we document similarities and differences among the estimates between high-skilled white collars and low-skilled blue collars.

We contribute to scholarship on the consequences of work effort by bridging the distinct literatures on well-being and career-related implications. We assess the two types of outcomes in one and the same sample of employees, allowing us to offer original insight into the comparative relevance of overtime work and work intensity for predicting well-being versus career-related outcomes. Additionally, by extending the interactive effects of work effort and discretion from well-being to career-related implications, we provide new and more comprehensive evidence on the role of discretion in conditioning work effort associations with employee outcomes.

Background

Work Effort and Employee Outcomes

Work effort has two dimensions (Green 2001; Kristensen, Bjorner, Christensen, and Borg 2004). The first is extensive work effort, or the duration of work. Overtime work is one prevalent aspect of extensive work effort and captures the amount of time an employee works in excess of normal hours. Both part-time and full-time employees can work overtime. The second dimension of work effort is work intensity (sometimes referred to as 'intensive work effort'), which has been defined as "the rate of physical and/or mental input to work tasks performed during the working day" (Green 2001: 56). Rather than referring to work duration, work intensity refers to the level of effort supplied per unit of working time.

A large literature has studied the implications of overtime work and work intensity for employee well-being. The core idea is that work effort of either kind is associated with reduced well-being, through several mechanisms. Overtime work prolongs an employee's exposure to workplace stressors and, by shortening the periods when an employee rests, decreases the ability to recover *between* working days (Sánchez 2017). Work intensity instead reduces or eliminates gaps between tasks during which the body or mind can rest, thus decreasing the employee's ability to recover *during* working days (Green 2001). A lack of recovery between or during working days may have cumulative effects because a fatigued employee requires progressively more effort to maintain adequate performance.

While some studies find limited support for an association between overtime work and aspects of employee well-being (Robone, Jones, and Rice 2011; Wood and De Menezes 2011), the balance of the available evidence is that greater work effort is associated with symptoms of stress, anxiety, depression, and burnout (Sparks, Cooper, Fried, and Shirom 1997; Golden and Wiens-Tuers 2006; Virtanen et al. 2011), inferior work-life balance (Schieman, Milkie, and Glavin 2009; Green et al. 2013; Boxall and Macky 2014), increased sleep deprivation and fatigue (Belman and Monaco 2001; Cottini and Lucifora 2013), poorer self-reported mental health (Goh, Pfeffer, and Zenios 2016), as well as reduced job-related well-being (Green, Felstead, Gallie, and Inanc 2016). Consequently, available arguments and evidence lead us to expect that *(I) overtime work and work intensity are negatively associated with employee well-being*.

Further, a small and separate literature in economics has focused on overtime work and its career-related consequences for employees within the firm. One argument has been that employers might perceive employees who supply overtime as more committed and motivated. Thus, overtime work may be taken by employers as a signal of employee value, which helps them to prioritize which employees should receive more opportunities for career advancement, improved terms of employment, or recognition more generally (Landers, Rebitzer, and Taylor 1996; Holmstrom 1999). Consistent with this theory, some studies suggest that overtime work may be positively associated with future promotions and earnings within the firm (Francesconi 2001; Pannenberg 2005; Anger 2008), both reflections of career advancement and recognition. Other evidence suggests that employees supplying more overtime might also be more likely to receive a permanent contract (Booth, Francesconi, and Frank 2002), thus improving their terms of employment through greater job security.

Others have argued that high effort levels might not be of a productive kind because work effort is subject to decreasing marginal returns (Chapman 1909; Green 2001, 2004b). Convergent with this idea, available evidence suggests that productivity decreases as working hours increase (Pencavel 2015), which can be attributed to the reduced opportunity for physical, mental, and emotional recovery associated with overtime work (Pencavel 2016; Sánchez 2017). Limited recovery in turn reduces the ability for sustained performance at a high cognitive level and increases the likelihood of mistakes, accidents, and injuries (e.g., Dembe, Erickson, Delbos, and Banks 2005; Folkard and Lombardi 2006). To the extent that such issues accumulate over time and become reflected in the quality of an employee's work, they may reduce his or her career-related opportunities.

Studies of the relationship between work effort and career-related outcomes have overwhelmingly focused on overtime work rather than work intensity. Nevertheless, we suspect that work intensity could have a signaling component similar to overtime work. Higher work intensity requires mental and/or physical input that can reflect employee value, commitment, or motivation, which may convey credible information to employers to the extent it is observable. Yet, if it cumulates to reduce quality, high work intensity might also be counterproductive like overtime work, which would harm career-related outcomes.

Overall, arguments and available evidence would imply two opposing expectations regarding the career-related implications of work effort. If work effort more strongly signals employee value than it is self-limiting and counterproductive, then *(IIa) overtime work and work intensity are positively associated with career-related outcomes*. If, instead, work effort is self-limiting and counterproductive more than it signals employee value, then *(IIb) overtime work and work intensity are negatively associated with career-related outcomes*.

The Role of Discretion

Work effort conceivably has direct implications for employees, yet all employees are not equally susceptible to its various consequences. Perhaps most prominently, a psychological literature on job strain has suggested that the consequences of work effort for well-being depend on "the discretion permitted the worker in deciding how to meet [job] demands" (Karasek 1979: 285). Here, we build on and extend the intuition of an interaction between work effort and discretion by examining its implications not just for well-being but also career-related outcomes. We define discretion as an employee's freedom to decide how and when to carry out his or her work (Ortega 2009a, 2009b; Moen et al. 2016).[1] We first outline some evidence on the discretion association with employee outcomes and then discuss how discretion may modify the well-being and career-related implications of work effort.

[1] In the literature, discretion has also been referred to as autonomy (e.g., Hackman and Oldham 1975), decision latitude (e.g., Karasek 1979), or job control (e.g., Van Yperen and Hagedoorn 2003).

Employees with greater discretion report lower levels of stress (Henly and Lambert 2014) and increased job satisfaction and well-being (De Menezes and Kelliher 2017; Wheatley 2017), and they tend to be more involved and committed (Wood, Holman, and Stride 2006; Lyness, Gornick, Stone, and Grotto 2012). Furthermore, employees who have control over when to work experience less work-life conflict (Kelly, Moen, and Tranby 2011). Discretion has also been related to reduced turnover intentions, voluntary turnover, job insecurity, and dismissals (Wood et al. 2006; Batt and Colvin 2011; Avgar, Pandey, and Kwon 2012; Gallie, Felstead, Green, and Inanc 2017), as well as enhanced career success (Leslie, Manchester, Park, and Mehng 2012).

While the implications of discretion for well-being and career-related outcomes are compelling in and of themselves, our interest is in the role of discretion in modifying the consequences of work effort. With respect to well-being, the 'job demands-control model' (Karasek 1979) suggests that discretion serves as a buffer that can alleviate the possibly adverse implications of work effort and so discretion should be of particular relevance to those employees supplying higher levels of effort. Discretion implies the opportunity to expend effort in ways and at times that are relatively more convenient for an employee. Therefore, work effort, whether overtime work or work intensity, may have less adverse well-being implications in employees with discretion. Illustrative evidence includes the finding that discretion is associated with reduced fatigue in nurses with highly demanding jobs (Van Yperen and Hagedoorn 2003); that the decline in well-being observed in the UK during the 1990s was "associated with a combination of rising work effort and declining task discretion" (Green 2004b: 616); and that, in a sample of European employees, work intensity is more adversely associated with job satisfaction in employees without discretion (Lopes, Lagoa, and Calapez 2014).

Discretion may also affect the way in which work effort translates to career-related outcomes, a relation thus far underemphasized in the literature. Discretion implies the freedom to adapt work in ways and to times when an employee believes his or her anticipated added value is greatest. As such, discretion may help an employee ease the progressive tension between work effort and the quality of output (Singh 2000). Recent findings provide indirect evidence consistent with such a relation, by showing that discretion may increase effort (Lott and Chung 2016; Beckmann, Cornelissen, and Kräkel 2017). This outcome has been interpreted largely as reflecting voluntary effort on the part of the employee: discretion may motivate greater work effort as an act of reciprocation to the employer (Kelliher and Anderson 2010) and it may increase the anticipated value of additional effort (Green 2004a; Beckmann et al. 2017). In either case, discretion-induced effort is typically interpreted as relatively more productive compared to a counterfactual increase in effort without discretion. Therefore, discretion may strengthen the positive signal generated through higher levels of work effort, while also curtailing its self-limiting and counterproductive tendencies.

Overall, the arguments and available evidence on the interaction between work effort and discretion lead us to expect, first, that *(III) work effort is less negatively associated with employee well-being in employees with more discretion*. Second, we also expect that *(IV) work effort is associated with better—either more positive or less negative—career-related outcomes in employees with more discretion*.

Occupational Differences

One relevant question concerns whether differences exist across occupations in how types of effort are associated with employee outcomes, and how discretion modifies such associations. High-skilled white collars are more likely to use overtime work to signal their value (Landers et al. 1996; Schieman and Glavin 2016) and may often feel they do so by choice (Michel 2011; Empson 2017). Instead, low-skilled blue collars may be more prone to involuntary pressures for intensive work, in part because they tend to have less discretion compared to high-skilled white collars (Kossek and Lautsch 2018). Thus, overtime associations with well-being and career-related outcomes might be relatively more favorable in higher-level occupations. Moreover, given the lesser prevalence of discretion in lower-level occupations, perhaps low-skilled blue collars that do have discretion benefit disproportionally relative to high-skilled white collars. We treat these issues as open empirical questions and explore them after our main analysis.

Method

Data and Sample

We analyze a pooled cross section of employees drawn from the fifth and sixth European Working Conditions Surveys (EWCSs), carried out by the European Foundation for the Improvement of Living and Working Conditions in 2010 and 2015, respectively. The EWCSs survey stratified random samples of employees through (face-to-face) interviews that cover issues like work effort, work organization, well-being, and careers. Prior waves of this survey have been used regularly in the literature, for example, by Green and McIntosh (2001) to study work intensification in Europe; Ortega (2009a, 2009b) to study discretion; and Avgoustaki (2016) to study the antecedents of extensive work effort.

Across the 2010 and 2015 waves of the EWCS, a total of 87,666 individuals were interviewed, covering 34 countries in 2010—i.e., the EU 27, Albania, Croatia, the Former Yugoslav Republic of Macedonia, Kosovo, Montenegro, Norway, and Turkey, and 35 countries in 2015—i.e., the EU 28, Albania, the Former Yugoslav Republic of Macedonia, Montenegro, Norway, Serbia, Switzerland, and Turkey. Before pooling the two waves, we imposed a small number of sampling rules. We omitted self-employed individuals, individuals below 16 and above 65 years old, as well as individuals whose tenure in their firm exceeded 50 years. Subsequently, we applied list-wise deletion in cases of missing values on any of the variables included in our model specifications. Together, these sampling rules produced our analysis sample, a pooled cross section of 51,895 employees from across 36 countries.

Outcome Variables

Employee Well-Being

The variable Stress is measured with a categorical variable asking respondents to indicate, on a 5-point scale (4 = always; 3 = most of the time; 2 = sometimes; 1 = rarely; and 0 = never), the extent to which they experience stress in their work. Fatigue is measured with a question asking whether an employee suffered from overall fatigue in the past 12 months (1 = yes; 0 = no). Satisfaction is measured with a question asking respondents to indicate, on a 4-point scale (3 = very satisfied; 2 = satisfied; 1 = not very satisfied; 0 = not at all satisfied), whether on the whole they are satisfied with the working conditions in their main job.

Career-Related Outcomes

The variable Career is measured with a question that captures, on a 5-point scale (4 = strongly agree; 3 = agree; 2 = neither agree nor disagree; 1 = disagree; and 0 = strongly disagree), whether an employee’s job offers good prospects for career advancement. Security is measured with a question that asks respondents to indicate their level of agreement or disagreement with the statement that they might lose their job in the next six months (4 = strongly disagree; 3 = disagree; 2 = neither agree nor disagree; 1 = agree; and 0 = strongly agree). The variable Recognition, available only in EWCS 2015, is measured with a question that asks respondents to indicate their level of agreement or disagreement with the statement that they receive the recognition they deserve for their work. Recognition is captured on a 5-point scale (4 = strongly agree; 3 = agree; 2 = neither agree nor disagree; 1 = disagree; and 0 = strongly disagree).

Explanatory Variables

Work Effort

The variable Overtime measures how often an employee worked in his or her free time to meet work demands in the past 12 months (4 = daily; 3 = several times a week; 2 = several times a month; 1 = less often; 0 = never). We capture intensive work effort with two ordinal indicators measured on a 6-point scale (6 = all of the time; 5 = almost all of the time; 4 = around ¾ of the time; 3 = around half of the time; 2 = around ¼ of the time; 1 = almost never; and 0 = never). The first indicator captures whether an employee's job involves working at very high speed and the second whether the job involves working to tight deadlines. Factor analysis shows that the two load onto one factor, with a Cronbach's alpha of 0.78, and so we define the variable Work intensity as the average of scores on the two indicators.

Discretion

We capture discretion with two variables, one for work discretion and another for discretion over one's schedule. Similar to Avgoustaki (2016), we measure the former, Work discretion, as the average of three dichotomous indicators (1 = yes; 0 = no) of an employee's discretion to choose the order of tasks, methods of work, and the rate or speed of work. We measure the latter, Schedule discretion, as the average of two indicators on an employee's discretion to adapt or entirely determine their working hours (1 = yes; 0 = no) and take breaks (1 = sometimes or always; 0 = rarely or never).

Controls

We control for a large number of factors that may confound associations among work effort, discretion, and outcomes. Evidence suggests that human resource practices (other than discretion) are associated with effort (Avgoustaki 2016) and the provision of discretion (Gittleman, Horrigan, and Joyce 1998; Ortega 2009a, 2009b). We control for four such practices: training, task rotation, productivity pay, and teamwork. We capture training with three dummy variables (1 = yes; 0 = no) for the types of training employees have undergone during the past 12 months: Employer-provided training (i.e., training paid for or provided by the employer), Employee-funded training (i.e., training paid for by the employee), and On-the-job training. Task rotation captures whether an employee's job involves rotating tasks, Productivity pay captures whether employees receive piece rate or other productivity payments, and Teamwork captures whether employees perform part of their work in a team. All three are dummies (1 = yes; 0 = no).

Additional controls include dichotomous variables (1 = yes; 0 = no) capturing whether employee remuneration includes payment for overtime (Paid overtime), whether an employee's pace of work is dependent on work done by colleagues (Pace of work dependent on colleagues), and whether his or her pace of work depends on the speed of a machine or movement of a product (Pace of work dependent on equipment). We also control for uncertainty at work through Task uncertainty, which captures, on a 4-point scale (3 = very often, to 0 = never), how often employees must interrupt one task to take on a different, unforeseen task. We control for Male, a dummy variable (1 = male; 0 = female) that absorbs gender differences in working conditions and outcomes. To capture age-dependent well-being (Blanchflower and Oswald 2017) and proxy for work experience, we control for Age in years and Age squared, and Log firm tenure, the log of an employee's tenure in the firm in years plus one. Employees with more responsibility may expend more effort and have more discretion and so we control for Log subordinates, the log of the number of people under an individual's supervision plus one.[2]

We also control for a broad range of fixed effects. We include fixed effects for 35 countries, 16 NACE industry sections, four sectors (public sector, joint private-public sector, not-for-profit sector, other; private sector omitted as reference), nine one-digit ISCO88 occupations, six one-digit ISCED education levels, five types of employment contracts (indefinite, fixed-term,

[2] We take the log to address positive skew in the distributions of tenure and subordinates.

temporary employment agency contract, apprenticeship or other training scheme, no contract; other contract omitted as reference), and two establishment size categories (10-249 employees and 250+ employees; 2-9 employees omitted as reference). In models for all outcomes except Recognition, which is available only for 2015, we include a fixed effect for survey year (1 = 2015; 0 = 2010). Table A.1 in the Online Appendix provides a comprehensive list of definitions and sources for all outcome and explanatory variables.

Main Results

Table 1 shows summary statistics for each survey wave separately as well as the pooled sample and provides correlations among the study variables in the pooled sample. From 2010 to 2015, the means suggest noteworthy increases in career prospects and job security, moderate increases in Stress, Satisfaction, and Work intensity, and a reduction in Overtime.

[[Table 1 near here]]

Among the six outcomes, Fatigue is a dummy variable and all others are ordinal variables. Therefore, we estimate binary logit models for Fatigue and ordered logit models for all other outcomes, using the explanatory variables described in the previous section. We report beta coefficients corresponding to the log of the unstandardized odds ratio. We also report odds ratios (OR) to examine the magnitude of the estimates. The explanatory variables differ in their underlying measurement scales and distributions. Therefore, we report odds ratios for an increase in each predictor from its 10th percentile to its 90th percentile, allowing for an appropriate comparison of effect sizes.[3] We obtain robust standard errors clustered by country-industry pairs to account for the possibility that survey responses are more similar among employees working in

[3] Relevant percentiles are given in Table A.2 in the Online Appendix.

a given industry in a given country. When unaccounted for, such non-independence may artificially reduce standard errors, increasing the probability of Type-I errors.

Overtime and Work Intensity Estimates

[[Table 2 near here]]

Table 2 shows the regression estimates that we use to assess the coefficients for Overtime and Work intensity. Unreported regression diagnostics indicate that collinearity is well within acceptable limits for all the key variables. After adjusting for a large number of covariates, Overtime is associated with increased Stress and Fatigue and decreased Satisfaction, as well as reduced levels of perceived career prospects, job security, and Recognition. Work intensity too is associated with increased Stress and Fatigue and decreased Satisfaction, as well as reduced levels of career prospects, job security, and Recognition. The coefficients are all precisely determined and so support expectations (I) and (IIb). The estimates provide no evidence for a positive association between types of work effort and the career-related outcomes. Thus, support is not found for expectation (IIa). These findings are consistent with prior evidence for a negative association between work effort and well-being (e.g., Golden and Wiens-Tuers 2006; Green et al. 2016), while they also resonate with the idea that overtime work may in the margin decrease the quality of work (e.g., Pencavel 2015, 2016) and so is associated with inferior career-related outcomes. Our estimates extend available findings by uncovering this negative association between overtime work and career-related outcomes but also by offering evidence for a similarly negative association involving work intensity.

The odds ratios show that the work effort associations with employee outcomes are fairly substantial relative to most other predictors.[4] The two measures of work effort are among the

[4] Odds ratios are directly comparable even within models because they are standardized to the 10-90 percentile range. Unstandardized odds ratios for the estimates in Table 2 (i.e., exp[β]) are given in Table A.3 in the Online Appendix.

most positively associated with Stress and Fatigue, and among the most negatively associated with Satisfaction, Security, and Recognition.[5] Moreover, associations between the two effort variables and ones capturing employee well-being tend to be more substantial than associations with the career-related outcomes. Across the six models, work intensity generally is a stronger predictor of unfavorable outcomes than overtime work. Except in the model predicting Career, these differences are large and particularly pronounced in the model predicting Stress.[6] Although prior studies have incorporated indicators of extensive and intensive effort to predict employee well-being (e.g., Wood and De Menezes 2011; Green et al. 2016), our focus on multiple types of outcomes supplies the novel insight that work intensity is important relative to overtime work for predicting both well-being and career-related outcomes.

The well-being versus career-related implications of work effort have been studied in separate literatures and so we lack estimates that are comparable across both types of outcomes. Our models, estimated on one and the same sample of employees, help bridge this gap between literatures and so extend prior findings, by suggesting that work effort does not seem to be associated with a balance of favorable and unfavorable outcomes, where career-related outcomes compensate for reduced well-being. Work effort broadly predicts unfavorable outcomes.

Work Effort Interactions with Discretion

Table 3 shows estimates for the interactions between dimensions of work effort and discretion, allowing us to assess the role of discretion in modifying the work effort associations with employee well-being (expectation (III)) and career-related outcomes (expectation (IV)).

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[5] Negative associations have odds ratios below unity. Odds ratios closer to zero imply more-strongly negative associations.

[6] Our measure for overtime work distinguishes employees by the frequency of overtime without reference to the duration of overtime. We have also undertaken an analysis using as an alternative measure for overtime work the number of days per month that an employee works more than ten hours. One might reasonably expect stronger effects for this measure because it uses an overtime threshold that is fairly conservative for most European countries (Avgoustaki 2016). Even compared to this alternative measure, work intensity generally is a stronger predictor of unfavorable well-being and career-related outcomes. These estimates are available from the authors on request.

Despite the introduction of four interaction effects in each of the models, unreported regression diagnostics indicate that collinearity remains within acceptable limits for all the key variables.

[[Table 3 near here]]

The interaction between Overtime and Work discretion is negatively associated with Stress and Fatigue and positively associated with Satisfaction, Security, and Recognition, while its association with Career is statistically insignificant. Coefficients for the interaction between Overtime and Schedule discretion are all indistinguishable from 0 at the 95% level. The interaction between Work intensity and Work discretion is positively associated with Satisfaction, Career, and Recognition, while its associations with Stress, Fatigue, and Security are statistically insignificant. Finally, the interaction between Work intensity and Schedule discretion is negatively associated with Fatigue and positively associated with Satisfaction and Career, while its associations with Stress, Security, and Recognition are statistically insignificant.

The statistically significant estimates in Table 3 are consistent with our expectations. Associations between work effort and employee well-being are less negative in employees with more discretion (particularly Work discretion), while in such employees associations between work effort and career-related outcomes are also relatively more favorable. These findings provide a measure of support for expectations (III) and (IV). These findings expand available evidence by showing that the interaction between work effort and discretion predicts not just well-being, as in previous studies building on Karasek (1979). Discretion also improves the association between work effort and career-related outcomes.

In Table 2, we established that work intensity generally is a stronger predictor of unfavorable outcomes than overtime work. However, the magnitudes of the odds ratios for the statistically significant interactions in Table 3 reveal that discretion more effectively improves associations between Work intensity and employee outcomes than it improves the Overtime associations with employee outcomes. Thus, one might ask whether discretion helps employees bridge the discrepancies between the two types of work effort in terms of their unfavorable associations with the various outcomes.

One straightforward way to explore this question is to calculate odds ratios for Overtime and Work intensity in employees with and without discretion. In Table 3, odds ratios for the main effects of Overtime and Work intensity represent effects for employees *without* discretion. Where effort-by-discretion interactions are statistically significant, odds ratios for employees *with* discretion can be obtained straightforwardly as $OR_{effort}*OR_{effort\times discretion}$. Table A.4 in the Online Appendix gives all odds ratios estimated this way. In the Career model, odds ratios for Work intensity in employees with discretion converge towards the odds ratio for Overtime.[7] In the Recognition model, odds ratios for Work intensity in employees with Work discretion converge towards the odds ratio for Overtime in employees without discretion. Instead, for Stress, Fatigue, Satisfaction, and Security, Work intensity *with* discretion remains a stronger predictor of unfavorable outcomes even when compared to Overtime *without* discretion. Therefore, even in employees with discretion, work intensity remains important relative to overtime work particularly for predicting well-being outcomes. This result underlines the importance of work intensity and nuances the role of discretion: while discretion may go some way toward alleviating unfavorable implications of work intensity, it may not fully resolve them.

Robustness

We assessed the robustness of our findings in two supplementary analyses.[8] First, in the period of recovery after the Great Recession, working conditions in different countries,

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[7] Post-hoc tests show that the respective odds ratios for Work intensity with Work discretion and Schedule discretion are statistically indistinguishable from 0.918, the odds ratio for Overtime (i.e., χ^2[1df] = 0.2, p = 0.65, and χ^2[1df] = 2.19, p = 0.14, respectively).

[8] The results for these robustness checks are available from the authors on request.

industries, sectors, and occupations may have developed at different rates. We re-estimated models 1-5 (model 6 covers only 2015) in Tables 2 and 3 after including fixed effects for country-year, industry-year, sector-year, and occupation-year pairs. These additional fixed effects offer a flexible approach to account for heterogeneity in the development of working conditions from 2010 to 2015. Estimates were similar in magnitude and remained well determined. Thus, we believe our results do not spuriously reflect uneven developments in working conditions.

Second, despite controls for a range of employee characteristics, it is possible that unobserved factors like ability may determine both effort and discretion as well as better career-related opportunities. This possibility would bias our estimates if such factors remain unabsorbed by included controls. To examine this possibility, we included in models 4-6 of Tables 2 and 3 an additional variable for whether the employee's salary increased in the past 12 months (1 = yes; 0 = no). Wage increases tend to be serially correlated even after accounting for observable characteristics and so past wage growth may be interpreted as a shadow of latent 'quality' (Baker, Gibbs, and Holmstrom 1994; Gibbons and Waldman 1999). Encouragingly, in these supplementary regressions, the results from Tables 2 and 3 replicate with only fractional differences in the effort and discretion coefficients and their precision.

Occupational Differences in Employee Outcomes

How are work effort and discretion associated with employee outcomes in different types of occupations? We examine this question by comparing upper- and lower-level occupations.[9] Table A.5 in the Online Appendix shows summary statistics for subsamples of high-skilled white collars and low-skilled blue collars. High-skilled white collars on average supply more overtime

[9] We have also undertaken a similar analysis for employees with contingent versus permanent contracts. The results of this supplementary analysis are available from the authors on request.

and have more discretion compared to low-skilled blue collars, while Work intensity is higher in low-skilled blue collars.

[[Table 4 near here]]

Table 4, Panel A, shows the main effects of Overtime and Work intensity in high-skilled white collars versus low-skilled blue collars. Overtime is less negatively associated with Satisfaction, Security, and Recognition in high-skilled white collars, while Work intensity shows a weaker association with Stress in such employees. Thus, the supply of effort may have more positive connotations in higher-level occupations, consistent with accounts of hard work being more normatively accepted as a practice among white collars (e.g., Ho 2009; Empson 2017). Yet, on aggregate all associations maintain the same sign and so work effort is persistently associated with greater Stress and Fatigue and lower Satisfaction, Career, Security, and Recognition.

Panels B and C show estimates based on samples split by low-skilled blue collars and high-skilled white collars, which allows us to assess interactions between work effort and discretion for these separate sets of employees. For the subsample of low-skilled blue collars, Panel B shows that discretion does not modify any of the associations involving Overtime. However, consistent with the idea that work intensity is perhaps a more pressing concern in lower-level occupations (Kossek and Lautsch 2018), Work discretion improves associations of Work intensity with Satisfaction, Career, and Recognition.[10]

Table 4, Panel C, shows that, in the subsample of high-skilled white collars, discretion improves several work effort associations with Stress, Satisfaction, Career, and Recognition,

[10] Work discretion increases the Work intensity association with Stress, yet the effect is less precisely determined and so, we believe, should not be over-interpreted. Given multiple predictors and outcomes, coefficients with *t*-statistics close to the cut-off for statistical significance are best interpreted cautiously (Romano, Shaikh, and Wolf 2010).

while Security is lower in employees with Schedule discretion working Overtime.[11] The interaction between Overtime and Schedule discretion in model 4 is worth singling out because it shows a rare sign reversal, where the Overtime association with Career is positive (rather than less negative) given Schedule discretion. Schedule discretion does not modify any of the associations involving Work intensity.

Overall, Table 4 suggests that discretion improves effort associations with outcomes in upper- and lower-level occupations alike, although relatively more so for work intensity in low-skilled blue collars and overtime work in high-skilled white collars.[12] These findings expand an, as yet, limited understanding of whether and how discretion practices have heterogeneous effects across occupations (Kossek and Lautsch 2018).

Conclusion

Our first objective has been to bridge the distinct literatures on the well-being and career-related effects of work effort, by offering an integrative analysis of the implications of overtime work and work intensity for employee well-being and career-related outcomes. Using micro data on a random sample of 51,895 European employees across 2010 and 2015, we have shown that greater work effort is associated with reduced well-being and inferior career-related outcomes. These findings hold true even in upper-level occupations (Table 4, Panel A), where the ambiguity surrounding performance evaluation plausibly enhances the career-related outcomes of visible work effort. The work effort associations with well-being stand out as particularly substantial. Between types of work effort, work intensity generally is a stronger predictor of unfavorable outcomes than overtime work. These results align with prior evidence on the negative relation

[11] It is possible that job insecurity elicits greater overtime in employees with schedule discretion. With available data, our analyses cannot easily adjudicate between this and other narratives, an issue we return to in the Conclusion.

[12] A pairwise statistical comparison of all effort-by-discretion interactions between low-skilled blue collars and high-skilled white collars gives results that are consistent with this conclusion. Table A.6 in the Online Appendix shows the χ^2-statistics for these comparisons and their *p*-values.

between work effort and employee well-being. They also imply that the self-limiting and counterproductive tendencies of work effort, whether overtime work or work intensity, outweigh the role of work effort as a value-signaling device. Moreover, the magnitude of the work intensity effects converges with suggestions in the work intensification literature that work intensity may pose greater threats to employee well-being than overtime work (e.g., Green 2004a).

Our second objective has been to examine how work effort associations with employee outcomes vary with the level of discretion given to employees. We have shown that discretion may reduce the adverse implications of work effort with respect to both well-being and career-related outcomes, but work intensity generally remains a strong predictor of unfavorable outcomes even in employees with discretion. Moreover, discretion might be more effective in helping high-skilled white collars deal with overtime work, and low-skilled blue collars with work intensity. These findings contribute to a more comprehensive view of the role of discretion in conditioning a broader set of outcomes beyond employee well-being.

Our analyses are based on observational data in a pooled cross section and so our findings must be treated cautiously. First, selectivity is a concern. Work effort and the availability of discretion vary systematically across employees, and their determinants might correlate with well-being and career-related outcomes. Our models contain a large number of controls for such confounding influences, yet it remains possible that relevant employee differences are omitted. Second, causality may operate from outcomes to work effort and discretion, an issue perhaps more pressing in the models for career-related outcomes: employees with limited career potential might experience more pressure to work hard, while ones with greater potential might more readily receive discretion.

We are reassured by essentially unaltered estimates in supplementary specifications controlling for past wage growth, and by the absence of systematic differences in the work intensity associations with career-related outcomes between high-skilled white collars and low-skilled blue collars. The latter is an unlikely result in the presence of consequential reverse causality from career potential to work effort, given that low-skilled blue collars with nowhere to go would be relatively more vulnerable to supervisory pressures for intense work. Longitudinal studies will be important to help address issues of unobserved heterogeneity. To establish cause and effect, scholars may also exploit exogenous shifts in labor regulations, some of which might change work effort without changing relevant outcomes per se.

Although we cannot draw definite causal inferences due to the empirical challenges that remain, our results certainly do not deny the possibility that work effort and discretion affect employee outcomes. In this vein, we explore some possible implications. Oftentimes, workers both complain and boast about excessive work effort (evidence for professionals abound—e.g., Ho 2009; Empson 2017), perhaps because they accept inferior well-being while anticipating career-related progress. Our results could imply that the latter might not materialize. If overtime work and work intensity pose challenges not just for well-being but also career-related outcomes, then employees must become more aware of the broader limitations of excessive work effort. The possible limitations of work effort also have implications for employers, who may worry about productivity and quality issues. Our findings foreshadow that greater discretion should be given when viable, and certainly where high levels of work effort are likely or unavoidable.

Governments have long recognized the issues involved in extensive work effort, for example, by imposing restrictions on standard working hours. And countries such as France and Italy have passed laws giving employees a right to disconnect from work. Some employers have followed suit by setting limits to out-of-hours communications. While all such initiatives concern the duration of work, our findings would imply that the intensity of work might have more severe ramifications for employees. This indicates a need for greater awareness of such potential effects among employers and policy makers, and for greater attention to strategies that may help relieve employees of undue exposure to intensive work. This is challenging not least because the evaluation of work intensity is complex relative to work duration. Suitable initiatives will take time to unfold (Lehndorff 2014) and may encounter resistance (Kellogg 2011), yet we believe they merit genuine consideration.

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Table 1. Summary Statistics and Correlations

		2010		2015		2010-2015										
		N=25,356		N=26,539		N=51,895										
	Variable	Mean	SD	Mean	SD	Mean	SD	1	2	3	4	5	6	7	8	9
1	Stress	1.87	1.15	1.92	1.14	1.90	1.15									
2	Fatigue	0.42	0.49	0.40	0.49	0.41	0.49	0.21								
3	Satisfaction	2.00	0.71	2.06	0.69	2.03	0.70	-0.22	-0.23							
4	Career	1.76	1.18	1.95	1.35	1.86	1.28	-0.03	-0.11	0.34						
5	Security	2.70	1.23	2.91	1.29	2.81	1.27	-0.05	-0.09	0.27	0.15					
6	Recognition (N=26,462)	—	—	2.61	1.17	—	—	-0.20	-0.18	0.50	0.44	0.20				
7	Overtime	0.94	1.16	0.73	1.01	0.83	1.09	0.21	0.10	-0.04	0.07	0.01	-0.04			
8	Work intensity	2.65	1.83	2.72	1.84	2.69	1.84	0.34	0.14	-0.18	-0.01	-0.09	-0.13	0.13		
9	Work discretion	0.65	0.39	0.66	0.39	0.65	0.39	-0.01	-0.02	0.18	0.16	0.15	0.16	0.13	-0.10	
10	Schedule discretion	0.41	0.35	0.43	0.36	0.42	0.35	-0.03	-0.07	0.19	0.16	0.12	0.19	0.12	-0.08	0.34
11	Employer-provided training	0.35	0.48	0.39	0.49	0.37	0.48	0.09	-0.02	0.13	0.18	0.13	0.10	0.14	0.00	0.14
12	Employee-funded training	0.06	0.24	0.07	0.25	0.06	0.25	0.06	0.03	0.02	0.06	-0.01	0.00	0.10	0.01	0.06
13	On-the-job training	0.37	0.48	0.38	0.49	0.38	0.48	0.06	0.00	0.09	0.16	0.07	0.08	0.10	0.03	0.09
14	Task rotation	0.51	0.50	0.52	0.50	0.52	0.50	0.07	0.03	-0.01	0.04	0.01	-0.01	0.04	0.12	0.02
15	Productivity pay	0.13	0.33	0.11	0.32	0.12	0.32	0.00	0.03	-0.04	0.02	-0.06	-0.01	0.03	0.08	-0.02
16	Teamwork	0.65	0.48	0.62	0.48	0.64	0.48	0.06	0.03	0.03	0.09	0.03	0.05	0.08	0.08	0.07
17	Paid overtime	0.32	0.47	0.34	0.48	0.33	0.47	0.03	0.00	0.02	0.06	0.04	0.01	0.03	0.09	-0.01
18	Pace of work dependent on colleagues	0.49	0.50	0.47	0.50	0.48	0.50	0.11	0.07	-0.08	0.04	-0.06	-0.06	0.05	0.25	-0.05
19	Pace of work dependent on equipment	0.18	0.39	0.20	0.40	0.19	0.39	0.04	0.05	-0.11	-0.04	-0.09	-0.07	-0.05	0.25	-0.17
20	Task uncertainty	1.24	0.94	1.25	0.91	1.24	0.93	0.24	0.08	-0.03	0.04	0.05	-0.07	0.23	0.22	0.16

21	Male	0.50	0.50	0.49	0.50	0.49	0.50	-0.04	-0.07	-0.02	0.06	-0.02	0.01	0.03	0.05	-0.03
22	Age	40.72	11.35	41.55	11.64	41.14	11.50	-0.01	0.00	0.01	-0.17	0.08	-0.03	0.00	-0.09	0.05
23	Log firm tenure	9.72	9.52	9.67	9.55	9.69	9.53	0.05	0.00	0.02	-0.06	0.19	-0.01	0.03	-0.05	0.06
24	Log subordinates	2.36	25.13	2.13	21.64	2.24	23.41	0.03	-0.01	0.03	0.05	0.02	0.02	0.06	0.03	0.05

	Variable	10	11	12	13	14	15	16	17	18	19	20	21	22	23
11	Employer-provided training	0.11													
12	Employee-funded training	0.01	0.09												
13	On-the-job training	0.08	0.43	0.09											
14	Task rotation	-0.04	0.09	0.02	0.14										
15	Productivity pay	0.01	-0.02	0.01	0.01	-0.01									
16	Teamwork	0.02	0.13	0.04	0.15	0.39	0.00								
17	Paid overtime	-0.04	0.06	0.00	0.08	0.09	0.14	0.06							
18	Pace of work dependent on colleagues	-0.04	0.01	0.00	0.04	0.23	0.05	0.23	0.07						
19	Pace of work dependent on equipment	-0.13	-0.07	-0.03	-0.02	0.08	0.11	0.04	0.10	0.20					
20	Task uncertainty	0.13	0.15	0.04	0.13	0.17	-0.05	0.15	0.02	0.15	-0.02				
21	Male	0.07	-0.02	-0.03	-0.02	0.01	0.08	0.02	0.12	0.08	0.14	-0.06			
22	Age	0.06	0.02	-0.04	-0.05	-0.05	-0.04	-0.02	-0.05	-0.07	-0.05	-0.03	-0.02		
23	Log firm tenure	0.03	0.09	-0.02	0.02	0.01	-0.04	0.04	0.00	-0.01	-0.02	0.03	0.02	0.56	
24	Log subordinates	0.06	0.04	0.00	0.02	0.00	0.00	0.02	0.00	0.03	-0.01	0.05	0.04	0.03	0.04

Notes: Correlations are for the pooled sample (2010-2015), except correlations involving Recognition (row/column (6)), which are for available observations in 2015 (N=26,462). To conserve space, correlations involving fixed effects for countries, industries, sectors, occupations, education levels, contract types, and establishment sizes are omitted.

Table 2. Regression Estimates for Employee Well-Being and Career-Related Outcomes

	Employee well-being						Career-related outcomes					
	Ordered logit		Binary logit		Ordered logit		Ordered logit					
	Stress		Fatigue		Satisfaction		Career		Security		Recognition	
	(1)		(2)		(3)		(4)		(5)		(6)	
Variable	β	OR	β	OR	β	OR	β	OR	β	OR	β	OR
Overtime	0.238***	1.608	0.183***	1.440	-0.159***	0.728	-0.040***	0.924	-0.042***	0.920	-0.157***	0.729
	[24.290]		[16.277]		[-14.710]		[-3.641]		[-3.983]		[-11.004]	
Work intensity	0.331***	6.166	0.143***	2.199	-0.150***	0.439	-0.021***	0.890	-0.069***	0.683	-0.100***	0.578
	[36.925]		[21.733]		[-23.352]		[-3.400]		[-12.147]		[-12.076]	
Work discretion	-0.170***	0.844	0.014	1.014	0.490***	1.633	0.392***	1.480	0.292***	1.339	0.455***	1.576
	[-6.370]		[0.412]		[18.366]		[13.642]		[10.301]		[12.889]	
Schedule discretion	-0.234***	0.791	-0.106**	0.900	0.614***	1.848	0.396***	1.486	0.269***	1.309	0.620***	1.858
	[-7.655]		[-3.161]		[17.713]		[11.535]		[8.625]		[15.626]	
Employer-provided training	0.086***	1.089	-0.025	0.975	0.225***	1.252	0.354***	1.424	0.180***	1.197	0.243***	1.275
	[4.146]		[-1.038]		[10.102]		[15.829]		[8.620]		[8.150]	
Employee-funded training[a]	0.117***	1.124	0.084*	1.087	-0.038	0.962	0.029	1.030	-0.189***	0.827	-0.127**	0.881
	[3.548]		[2.069]		[-0.987]		[0.755]		[-5.327]		[-2.656]	
On-the-job training	0.012	1.012	0.080***	1.083	0.126***	1.134	0.228***	1.256	0.012	1.012	0.167***	1.182
	[0.684]		[3.365]		[5.434]		[10.451]		[0.527]		[6.280]	
Task rotation	0.071***	1.073	0.110***	1.116	-0.057**	0.944	0.005	1.005	0.009	1.009	0.005	1.005
	[3.718]		[4.730]		[-2.667]		[0.232]		[0.447]		[0.183]	
Productivity pay	0.016	1.016	0.011	1.011	0.021	1.021	0.138***	1.148	-0.065*	0.937	0.124**	1.132
	[0.539]		[0.288]		[0.676]		[4.761]		[-2.168]		[2.964]	
Teamwork	-0.007	0.993	0.017	1.017	0.129***	1.137	0.178***	1.195	0.069***	1.071	0.185***	1.203
	[-0.324]		[0.687]		[6.082]		[8.915]		[3.692]		[6.537]	
Paid overtime	-0.019	0.981	0.050*	1.051	0.143***	1.154	0.258***	1.294	0.142***	1.152	0.122***	1.130
	[-1.012]		[2.163]		[6.431]		[11.950]		[7.477]		[3.822]	
Pace of work dependent on colleagues	0.098***	1.103	0.042	1.043	-0.090***	0.914	0.038*	1.038	-0.111***	0.895	-0.075**	0.928
	[5.332]		[1.664]		[-4.536]		[2.294]		[-5.931]		[-2.992]	
Pace of work dependent on equipment	-0.009	0.991	0.054	1.056	-0.053*	0.948	0.032	1.032	-0.045	0.956	-0.029	0.971
	[-0.359]		[1.919]		[-2.030]		[1.195]		[-1.897]		[-0.838]	

Task uncertainty	0.319***	2.605	0.213***	1.893	-0.219***	0.518	-0.130***	0.677	-0.065***	0.823	-0.221***	0.514
	[24.904]		[15.925]		[-16.015]		[-11.374]		[-5.596]		[-14.109]	
Male	-0.107***	0.898	-0.334***	0.716	-0.037	0.964	0.180***	1.198	-0.058**	0.944	-0.046	0.956
	[-5.362]		[-14.465]		[-1.706]		[8.334]		[-2.669]		[-1.799]	
Age	0.046***	4.348	0.033***	2.915	-0.048***	0.214	-0.043***	0.253	-0.060***	0.148	-0.053***	0.181
	[7.656]		[4.264]		[-7.405]		[-6.645]		[-9.445]		[-6.538]	
Age squared	-0.001***	0.072	-0.000***	1.000	0.001***	13.77	0.000*	1.000	0.001***	13.77	0.001***	13.77
	[-8.024]		[-3.320]		[6.549]		[2.233]		[7.956]		[6.237]	
Log firm tenure	0.117***	1.457	0.006	1.019	-0.010	0.968	-0.048***	0.856	0.310***	2.716	-0.046**	0.862
	[9.840]		[0.474]		[-0.730]		[-3.636]		[21.131]		[-2.608]	
Log subordinates	0.045***	1.051	-0.082***	0.914	0.153***	1.183	0.236***	1.296	0.056***	1.063	0.138***	1.164
	[3.752]		[-5.574]		[11.905]		[17.841]		[4.324]		[8.043]	
Year 2015	0.086***	1.090	-0.036	0.965	0.161***	1.175	0.272***	1.312	0.493***	1.637	—	—
	[3.975]		[-1.113]		[5.749]		[10.095]		[16.312]		—	
Fixed effects[b]	Yes		Yes		Yes		Yes		Yes		Yes	
Log pseudolikelihood	-70,708		-31,304		-49,014		-76,055		-68,711		-36,460	
Number of observations	51,895		51,895		51,895		51,895		51,895		26,462	

Notes: *Statistically significant at the .05 level; ** at the .01 level; *** at the .001 level. β are beta coefficients from ordered (models 1, 3-6) and binary (model 2) logit regressions, with *t*-statistics in brackets, based on robust standard errors clustered by country × industry pairs. OR are odds ratios associated with an increase in each predictor from its 10th percentile to its 90th percentile. Relevant percentiles and unstandardized odds ratios (i.e., exp[β]) are given in Tables A.2 and A.3 in the Online Appendix. Estimates in models 1 to 5 are for the pooled sample (2010-2015); estimates in model 6 are for 2015.

a. The 10th and 90th percentiles of Employee-funded training are identical and so its odds ratios are given for the 94th relative to the 10th percentile.

b. Fixed effects are for counties (35), industries (16), sectors (4), occupations (9), education levels (6), contract types (5), and establishment sizes (2).

Table 3. Regression Estimates for Employee Well-Being and Career-Related Outcomes: Work Effort Interactions with Discretion

	Employee well-being						Career-related outcomes					
	Ordered logit		Binary logit		Ordered logit		Ordered logit					
	Stress		Fatigue		Satisfaction		Career		Security		Recognition	
	(1)		(2)		(3)		(4)		(5)		(6)	
Variable	β	OR	β	OR	β	OR	β	OR	β	OR	β	OR
Overtime	0.280***	1.750	0.245***	1.633	-0.221***	0.643	-0.043*	0.918	-0.060**	0.885	-0.213***	0.654
	[14.365]		[9.810]		[-9.856]		[-2.290]		[-3.047]		[-7.440]	
Work intensity	0.353***	6.960	0.173***	2.591	-0.214***	0.310	-0.103***	0.567	-0.087***	0.621	-0.153***	0.431
	[24.267]		[15.301]		[-18.007]		[-9.415]		[-8.742]		[-10.694]	
Work discretion	-0.070	0.932	0.132*	1.141	0.243***	1.276	0.159***	1.173	0.189***	1.209	0.215***	1.239
	[-1.491]		[2.465]		[5.539]		[3.640]		[4.246]		[3.674]	
Schedule discretion	-0.172***	0.842	0.024	1.024	0.461***	1.586	0.199***	1.220	0.281***	1.324	0.551***	1.734
	[-3.302]		[0.389]		[8.026]		[3.661]		[5.146]		[8.052]	
Overtime × Work discretion	-0.052*	0.901	-0.086**	0.841	0.074**	1.160	-0.020	0.962	0.057*	1.121	0.088**	1.192
	[-2.267]		[-2.935]		[2.859]		[-0.801]		[2.393]		[2.738]	
Overtime × Schedule discretion	-0.013	0.974	-0.004	0.992	0.021	1.044	0.035	1.071	-0.049	0.906	-0.017	0.966
	[-0.579]		[-0.128]		[0.829]		[1.420]		[-1.815]		[-0.507]	
Work intensity × Work discretion	-0.024	0.875	-0.021	0.895	0.073***	1.496	0.093***	1.672	0.022	1.133	0.069***	1.458
	[-1.604]		[-1.432]		[5.203]		[6.976]		[1.633]		[3.602]	
Work intensity × Schedule discretion	-0.018	0.905	-0.045**	0.781	0.048**	1.308	0.060***	1.392	0.012	1.068	0.029	1.177
	[-1.191]		[-2.691]		[2.792]		[3.622]		[0.788]		[1.483]	
Controls[a]	Yes		Yes		Yes		Yes		Yes		Yes	
Log pseudolikelihood	-70,698		-31,290		-48,972		-75,995		-68,703		-36,442	
Number of observations	51,895		51,895		51,895		51,895		51,895		26,462	

Notes: *Statistically significant at the .05 level; ** at the .01 level; *** at the .001 level. β are beta coefficients from ordered (models 1, 3-6) and binary (model 2) logit regressions, with *t*-statistics in brackets, based on robust standard errors clustered by country × industry pairs. OR are odds ratios associated with an increase in each predictor from its 10th percentile to its 90th percentile. Relevant percentiles are given in Table A.2 in the Online Appendix. Coefficients and odds ratios for the main effects of Overtime and Work intensity represent effects for employees without discretion. Estimates in models 1 to 5 are for the pooled sample (2010-2015); estimates in column 6 are for 2015.

a. All models include the same set of control variables as in Table 2.

Table 4. Regression Estimates for Employee Well-Being and Career-Related Outcomes: Results for High-Skilled White Collars versus Low-Skilled Blue Collars

	Employee well-being			Career-related outcomes		
	Ordered logit	Binary logit	Ordered logit		Ordered logit	
	Stress	Fatigue	Satisfaction	Career	Security	Recognition
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Full sample						
Overtime	0.248***	0.176***	-0.175***	-0.023	-0.063***	-0.197***
	[17.550]	[13.004]	[-12.663]	[-1.683]	[-4.925]	[-9.465]
Work intensity	0.358***	0.137***	-0.151***	-0.025***	-0.072***	-0.109***
	[33.164]	[17.052]	[-18.987]	[-3.294]	[-10.925]	[-10.359]
High-skilled white collar[a]	0.552***	-0.253***	0.469***	0.917***	0.080	0.180**
	[11.172]	[-4.946]	[9.858]	[17.453]	[1.879]	[3.026]
Overtime × High-skilled white collar[a]	-0.011	0.012	0.039*	-0.022	0.050*	0.083**
	[-0.609]	[0.556]	[2.205]	[-1.164]	[2.531]	[2.987]
Work intensity × High-skilled white collar[a]	-0.073***	0.017	0.003	0.009	0.009	0.025
	[-5.826]	[1.327]	[0.223]	[0.772]	[0.864]	[1.600]
Controls[b]	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	51,895	51,895	51,895	51,895	51,895	26,462
Panel B: Subsample of low-skilled blue collars						
Overtime	0.197***	0.173***	-0.115*	-0.005	-0.113**	-0.188**
	[5.237]	[3.715]	[-2.428]	[-0.133]	[-2.973]	[-3.095]
Work intensity	0.351***	0.174***	-0.241***	-0.158***	-0.106***	-0.187***
	[15.907]	[7.758]	[-10.876]	[-8.028]	[-5.651]	[-7.278]
Work discretion	-0.247**	0.097	0.195	-0.050	0.212*	-0.066
	[-2.684]	[0.812]	[1.884]	[-0.503]	[2.093]	[-0.497]
Schedule discretion	-0.082	0.066	0.390**	0.097	0.207	0.755***
	[-0.680]	[0.467]	[2.679]	[0.729]	[1.516]	[4.251]
Overtime × Work discretion	0.030	-0.000	-0.111	0.030	-0.003	0.038
	[0.551]	[-0.004]	[-1.801]	[0.544]	[-0.055]	[0.410]
Overtime × Schedule discretion	0.030	-0.058	0.107	0.022	0.088	0.120
	[0.455]	[-0.688]	[1.355]	[0.330]	[1.224]	[0.997]
Work intensity × Work discretion	0.056*	-0.001	0.071**	0.111***	0.024	0.115*
	[2.016]	[-0.024]	[2.580]	[4.288]	[0.852]	[2.463]
Work intensity × Schedule discretion	-0.064	-0.080*	0.078	0.124***	0.004	-0.014
	[-1.661]	[-2.188]	[1.827]	[3.359]	[0.093]	[-0.265]
Controls[b]	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	9,242	9,242	9,242	9,242	9,242	4,494
Panel C: Subsample of high-skilled white collars						
Overtime	0.310***	0.215***	-0.219***	-0.019	0.014	-0.218***
	[8.410]	[5.515]	[-5.470]	[-0.586]	[0.421]	[-4.431]

Work intensity	0.336***	0.188***	-0.248***	-0.094***	-0.092***	-0.183***
	[13.115]	[7.386]	[-10.922]	[-4.128]	[-4.231]	[-6.153]
Work discretion	0.020	0.093	0.159	0.225**	0.261**	0.092
	[0.240]	[0.908]	[1.925]	[2.929]	[3.246]	[0.789]
Schedule discretion	-0.283**	-0.082	0.331***	0.099	0.287***	0.358**
	[-3.131]	[-0.779]	[3.941]	[1.273]	[3.507]	[3.291]
Overtime × Work discretion	-0.098*	-0.068	0.115**	-0.056	0.020	0.149**
	[-2.457]	[-1.547]	[2.734]	[-1.510]	[0.582]	[2.627]
Overtime × Schedule	0.042	0.061	0.004	0.099***	-0.098**	-0.010
discretion	[1.399]	[1.447]	[0.088]	[3.400]	[-2.966]	[-0.203]
Work intensity × Work	-0.013	-0.033	0.117***	0.103***	0.025	0.094**
discretion	[-0.473]	[-1.148]	[4.233]	[3.877]	[1.009]	[2.649]
Work intensity × Schedule	0.001	-0.031	0.050	0.027	0.015	0.046
discretion	[0.056]	[-1.198]	[1.897]	[1.078]	[0.665]	[1.473]
Controls[b]	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	19,911	19,911	19,911	19,911	19,911	10,221

Notes: *Statistically significant at the .05 level; ** at the .01 level; *** at the .001 level. Coefficients are from ordered (models 1, 3-6) and binary (model 2) logit regressions, with *t*-statistics in brackets, based on robust standard errors clustered by country × industry pairs. Each column contains three separate models, one estimated for the full sample, one for the subsample of low-skilled blue collars, and one for the subsample of high-skilled white collars. Low-skilled blue collars are plant and machine operators and assemblers and individuals in elementary occupations (ISCO88 codes 8 and 9). High-skilled white collars are legislators, senior officials and managers, professionals, technicians, and associate professionals (ISCO88 codes 1, 2, and 3). Estimates in columns (1) to (5) are for the pooled sample (2010-2015); estimates in column (6) are for 2015.

a. High-skilled white collar is a dummy variable set to 1 for legislators, senior officials and managers, professionals, technicians, and associate professionals (ISCO88 codes 1, 2, and 3), and 0 otherwise.

b. Except for occupation fixed effects, all models include control variables as in Table 2. Models of panel A also include fixed effects for ISCO88 codes 4-7 and 10 and so coefficients on High-skilled white collar are relative to low-skilled blue collars. Due to collinearity, an ordinal measure for education level substitutes education level fixed effects in column (6) of panel C.

Online Appendix

Table A.1. Variable Definitions and Sources

Variable	Question(s)	Scales	Question # EWCS 2010	Question # EWCS 2015
Stress	You experience stress in your work	0 (never) - 4 (always)	51N	61M
Fatigue	Over the last 12 months, did you suffer from overall fatigue?	0 = no; 1 = yes	69L	78I
Satisfaction	On the whole, are you very satisfied, satisfied, not very satisfied or not at all satisfied with working conditions in your main paid job?	0 (not at all satisfied) - 3 (very satisfied)	76	88
Career	My job offers good prospects for career advancement	0 (strongly disagree) - 4 (strongly agree)	77C	89B
Security	I might lose my job in the next 6 months	0 (strongly agree) - 4 (strongly disagree)	77A	89G
Recognition	I receive the recognition I deserve for my work	0 (strongly disagree) - 4 (strongly agree)	—	89C
Overtime	Over the last 12 months, how often have you worked in your free time to meet work demands?	0 (never) - 4 (every day)	42	46
Work intensity	Simple average of answers to:			
	Does your job involve working at very high speed?	0 (never) - 6 (all of the time)	45A	49A
	Does your job involve working to tight deadlines?	0 (never) - 6 (all of the time)	45B	49B
Work discretion	Simple average of answers to:			
	Are you able to choose or change your order of tasks?	0 = no; 1 = yes	50A	54A
	Are you able to choose or change your methods of work?	0 = no; 1 = yes	50B	54B
	Are you able to choose or change your speed or rate of work?	0 = no; 1 = yes	50C	54C
Schedule discretion	Simple average of answers to:			
	Can you adapt or entirely determine your working hours?	0 = no; 1 = yes	39	42
	You can take a break when you wish	0 = rarely or never; 1 = sometimes or always	51F	61F

Employer-provided training	Over the past 12 months, have you undergone training paid for or provided by your employer to improve your skills?	0 = no; 1 = yes	61A	65A
Employee-funded training	Over the past 12 months, have you undergone training paid for by yourself to improve your skills?	0 = no; 1 = yes	61B	65B
On-the-job training	Over the past 12 months, have you undergone on-the-job training to improve your skills?	0 = no; 1 = yes	61C	65C
Task rotation	Does your job involve rotating tasks between yourself and colleagues?	0 = no; 1 = yes	53	55
Productivity pay	Do the earnings from your main job include piece rate or productivity payments?	0 = no; 1 = yes	EF7B	101B
Teamwork	Do you work in a group or team that has common tasks and can plan its work?	0 = no; 1 = yes	56	58
Paid overtime	Do the earnings from your main job include extra payments for additional hours of work/overtime?	0 = no; 1 = yes	EF7C	101C
Pace of work dependent on colleagues	On the whole, is your pace of work dependent on the work done by colleagues?	0 = no; 1 = yes	46A	50A
Pace of work dependent on equipment	On the whole, is your pace of work dependent on the automatic speed of a machine or movement of a product?	0 = no; 1 = yes	46D	50D
Task uncertainty	How often do you have to interrupt a task you are doing in order to take on an unforeseen task?	0 (never) - 3 (very often)	47	51
Male	Gender	0 = female; 1 = male	HH2a	2a
Age	Age in years	Continuous	HH2b	2b
Log firm tenure	Natural logarithm of answer (+1) to:			
	How many years have you been in your company or organization?	Continuous	12	17
Log subordinates	Natural logarithm of answer (+1) to:			
	How many people work under your supervision, for whom pay increases, bonuses or promotion depend directly on you?	Continuous	17	23
Year 2015	Survey year	0 = 2010; 1 = 2015	—	—
Country	Dummy variables for country of interview		—	—
Industry	Dummy variables for one-digit NACE industry sections		9	13

Sector	Dummy variables for private, public, joint private-public, not-for-profit, and other sectors	10	14
Occupation	Dummy variables for one-digit ISCO88 occupations	2, 3	5, 6
Education level	Dummy variables for one-digit ISCED education levels	EF1	106
Contract type	Dummy variables for permanent contract, fixed term contract, temporary employment agency contract, apprenticeship or other training scheme, no contract, and other contract	7	11
Establishment size	Dummy variables for establishments with 2-9, 10-249, and 250+ employees	11	16a, 16b

Notes: All variables are based on the fifth and sixth European Working Condition Surveys (EWCS 2010 and EWCS 2015). The last two columns refer to the specific questions in the two surveys.

Table A.2. 10th and 90th Percentiles for Explanatory Variables

Variable	10th Percentile	90th Percentile
Overtime	0	2
Work intensity	0	5.5
Work discretion	0	1
Schedule discretion	0	1
Employer-provided training	0	1
Employee-funded training	0	0
On-the-job training	0	1
Task rotation	0	1
Productivity pay	0	1
Teamwork	0	1
Paid overtime	0	1
Pace of work dependent on colleagues	0	1
Pace of work dependent on equipment	0	1
Task uncertainty	0	3
Male	0	1
Age	25	57
Age squared	625	3,249
Log firm tenure	0	3.219
Log subordinates	0	1.099
Year 2015	0	1

Table A.3. Unstandardized Odds Ratios for Estimates in Table 2

	Employee well-being			Career-related outcomes		
	Ordered logit	Binary logit	Ordered logit	Ordered logit		
	Stress	Fatigue	Satisfaction	Career	Security	Recognition
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Overtime	1.268	1.200	0.853	0.961	0.959	0.854
Work intensity	1.392	1.154	0.861	0.979	0.933	0.905
Work discretion	0.844	1.014	1.633	1.480	1.339	1.576
Schedule discretion	0.791	0.900	1.848	1.486	1.309	1.858
Employer-provided training	1.089	0.975	1.252	1.424	1.197	1.275
Employee-funded training	1.124	1.087	0.962	1.030	0.827	0.881
On-the-job training	1.012	1.083	1.134	1.256	1.012	1.182
Task rotation	1.073	1.116	0.944	1.005	1.009	1.005
Productivity pay	1.016	1.011	1.021	1.148	0.937	1.132
Teamwork	0.993	1.017	1.137	1.195	1.071	1.203
Paid overtime	0.981	1.051	1.154	1.294	1.152	1.130
Pace of work dependent on colleagues	1.103	1.043	0.914	1.038	0.895	0.928
Pace of work dependent on equipment	0.991	1.056	0.948	1.032	0.956	0.971
Task uncertainty	1.376	1.237	0.803	0.878	0.937	0.801
Male	0.898	0.716	0.964	1.198	0.944	0.956
Age	1.047	1.034	0.953	0.958	0.942	0.948
Age squared	0.999	1.000	1.001	1.000	1.001	1.001
Log firm tenure	1.124	1.006	0.990	0.953	1.364	0.955
Log subordinates	1.046	0.921	1.165	1.266	1.057	1.148
Year 2015	1.090	0.965	1.175	1.312	1.637	—

Notes: Unstandardized odds ratios are shown, calculated as exp[β], based on the β coefficients in Table 2.

Table A.4. Odds Ratios for Overtime and Work Intensity in Employees with/without Discretion

	Employee well-being			Career-related outcomes		
	Ordered logit	Binary logit	Ordered logit	Ordered logit		
	Stress	Fatigue	Satisfaction	Career	Security	Recognition
	(1)	(2)	(3)	(4)	(5)	(6)
Overtime						
Without discretion	1.750	1.633	0.643	0.918	0.885	0.654
With Work discretion	1.577	1.373	0.746	0.918	0.993	0.780
With Schedule discretion	1.750	1.633	0.643	0.918	0.885	0.654
Work intensity						
Without discretion	6.960	2.591	0.310	0.567	0.621	0.431
With Work discretion	6.960	2.591	0.463	0.948	0.621	0.628
With Schedule discretion	6.960	2.024	0.405	0.789	0.621	0.431

Notes: Values are odds ratios associated with an increase in each predictor from its 10th percentile to its 90th percentile. For interactions that are indistinguishable from 0 at the 95% level, odds ratios with discretion are equal to odds ratios without discretion. All predictions are based on the estimates in Table 3.

Table A.5. Summary Statistics by Occupation[a]

	High-skilled white collars (N=19,911)		Low-skilled blue collars (N=9,242)	
Variable	Mean	SD	Mean	SD
Stress	2.05	1.07	1.71	1.25
Fatigue	0.40	0.49	0.44	0.5
Satisfaction	2.16	0.66	1.85	0.74
Career	2.22	1.22	1.35	1.22
Security	3.05	1.18	2.55	1.33
Recognition[b]	2.77	1.09	2.38	1.25
Overtime	1.18	1.21	0.57	0.94
Work intensity	2.55	1.75	2.88	1.96
Work discretion	0.78	0.33	0.51	0.42
Schedule discretion	0.52	0.38	0.32	0.31

a. High-skilled white collars are legislators, senior officials and managers, professionals, technicians, and associate professionals (ISCO88 codes 1, 2, and 3). Low-skilled blue collars are plant and machine operators and assemblers and elementary occupations (ISCO88 codes 8 and 9).

b. Recognition is available only in EWCS 2015 and so sample sizes are N=10,221 for high-skilled white collars and N=4,494 for low-skilled blue collars.

Table A.6. Tests of Differences in Effort-by-Discretion Interactions between Low-Skilled Blue Collars and High-Skilled White Collars

	Stress	Fatigue	Satisfaction	Career	Security	Recognition
Overtime × Work discretion	3.56	0.74	9.71	1.60	0.12	1.08
	[0.059]	[0.390]	[0.002]	[0.205]	[0.731]	[0.299]
Overtime × Schedule discretion	0.03	1.54	1.25	1.07	5.48	1.00
	[0.874]	[0.214]	[0.263]	[0.301]	[0.019]	[0.318]
Work intensity × Work discretion	2.98	0.55	1.33	0.05	0.00	0.12
	[0.084]	[0.458]	[0.248]	[0.820]	[0.977]	[0.730]
Work intensity × Schedule discretion	2.03	1.23	0.31	4.69	0.06	1.01
	[0.155]	[0.268]	[0.577]	[0.030]	[0.812]	[0.315]

Notes: χ^2-statistics (1df) are shown, with *p*-values in brackets, testing differences in the magnitudes of the effort-by-discretion interactions across models for low-skilled blue collars (Table 4, Panel B) and high-skilled white collars (Table 4, Panel C).