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DOI

[10.1111/puar.13691](https://doi.org/10.1111/puar.13691)

Publication date

2024

Document Version

Final published version

Published in

Public Administration Review

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Citation for published version (APA):

van Triest, S. (2024). Incentives and effort in the public and private sector. *Public Administration Review*, 84(2), 233-247. <https://doi.org/10.1111/puar.13691>

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Incentives and effort in the public and private sector

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Abstract

While public service motivation theory suggests that public sector employees have higher levels of intrinsic motivation, average pay levels in the public sector are not lower, so public sector employees also value financial incentives. We investigate the relationship of financial incentives with effort (measured with unpaid overtime) for public versus private sector employees using a UK sample. Bonuses are used much less in the public sector, but their relationship with effort is not different between sectors. Public sector employees exert more effort when base pay is higher and do so to a somewhat higher extent than private sector employees. However, public sector employees increase effort more when effort is an important promotion criterion and when perceived job security is higher. Thus, implicit incentives resulting from being in a secure job and developing in that job are more effective for public sector employees than for private sector employees.

Evidence for Practice

- Similar to private sector employees, public sector employees provide more effort (measured as the amount of unpaid overtime) at higher levels of base pay; an increase in base pay has a somewhat stronger effect for public sector employees.
- Bonuses are used much less in the public sector than in the private sector; when they are used, their impact on effort is not significantly different between the sectors.
- For public sector employees, being in a secure job and being able to grow and develop in that job has a stronger positive effect on effort than for private sector employees, reflecting that public sector employees value the opportunity to contribute to organizational goals that they find important.

INTRODUCTION

This article investigates whether the relationship between monetary incentives and effort is different for employees in the public sector relative to private sector employees. Incentives are an important component of management practices in both public and private sector organizations: in OECD countries average public sector pay is somewhat or substantially higher than average private sector pay (Depalo et al., 2015; Lucifora & Meurs, 2006). At the same time, descriptive evidence shows there is a substantial difference in the structure of financial incentives between the public and private sectors (Van De Voorde & Beijer, 2015): it is well established that there is a much lower use of performance-related incentives in the public sector (Bryson et al., 2017; Burgess & Ratto, 2003).

Public service motivation (PSM) theory (Perry & Wise, 1990) argues that relative to private sector employees, public sector employees tend to derive more meaning from the work itself; as a consequence, they are motivated intrinsically and require less incentivizing by external rewards (Della Torre et al., 2020; Frey et al., 2013). When employees find more meaning and value in their jobs, contributing to the organization's goals will reinforce the value derived from base pay, which compensates for the absence of external rewards (Cassar, 2019; Francois, 2000). Additionally, progressing within the organization will be more rewarding for intrinsically motivated employees since, at higher job levels, employees typically have more impact on achieving the organization's goals (Bidwell & Mollick, 2015). Thus, relative to private sector employees, public sector employees may

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experience more rewards from doing their job well and from progressing within that job. This suggests that the relationship between different incentive types and employee outcomes may differ between the public and private sectors.

In this article, we investigate whether this is the case using data from the United Kingdom. Lucifora and Meurs (2006) report that average hourly pay is 6 percent higher for public sector workers than for private sector workers in the United Kingdom, and Murphy et al. (2020) find a similar gap in favor of public sector workers using the 2017 data. Thus, the UK setting is comparable to the OECD average. We use survey data on incentives and effort from the 2011 version of the Workplace Employment Relations Survey or 2011 WERS, a large-scale survey in the United Kingdom supported by the UK government (WERS, 2020). WERS respondents report whether they receive performance-related bonuses (although not on the magnitude of these bonuses) and their basic pay level in (ranges of) pounds. In addition, respondents report their experienced job security and pay satisfaction, as well as their assessment of whether working long hours is required to progress in the job.

Evaluating the impact of the different types of incentives in a heterogenous empirical setting is difficult due to the variation in performance outcomes among various sectors. We address this challenge by investigating the relationship between incentives and effort, rather than performance, using the extent of unpaid overtime as effort indicator. While the ultimate aim of providing incentives is increased performance, the link from incentives to performance runs through effort: providing incentives leads employees to increase their effort, and this increased effort leads to higher performance (Avgoustaki & Bessa, 2019; Bonner & Sprinkle, 2002; Sandvik et al., 2021).

Our findings help in understanding how incentives in the public sector have similar or different effects on employee effort relative to the private sector. While the difficulties of applying pay-for-performance and the differences in intrinsic motivation may help in explaining the different structuring of incentives in both sectors (Burgess & Ratto, 2003), public sector organizations do offer financial incentives to their employees. By emphasizing the difficulties of using explicit incentives in the public sector (e.g., Frey et al., 2013), the effects of implicit incentives are somewhat overlooked. Our results contribute to the literature on the use of different incentive options in the public sector (Bellé, 2015; Durant et al., 2006).

BACKGROUND AND PREVIOUS LITERATURE

Explicit and implicit incentives

Organizations use incentives as part of their control system to motivate employees to put in effort toward achieving the organization's goals (Cardinal et al., 2017). People react to explicit incentives tied to a performance

measure, as has been demonstrated extensively in laboratory work (DellaVigna & Pope, 2018) and to a lesser extent in empirical work (Sandvik et al., 2021). At the same time, the financial effects of incentives resulting from having a job with a base pay and being able to progress in that job are likely very substantial (Gibbs, 1995). For example, Baik et al. (2016) report a median increase in pay following promotion to a higher job level of 21 percent–33 percent in a sample of 200 firms. With these pay increases recurring every year, their cumulative effect is likely greater than that of one-time bonuses.

The relationship between explicit incentives and performance is straightforward: reaching a performance target results in a bonus. The relationship of base pay and promotions with performance is less direct, and for this reason, they are referred to as implicit incentives (e.g., Baik et al., 2016). While there is little empirical evidence on the way firms decide on merit pay and promotions (Gerhart et al., 2009, p. 262), it is likely that performance plays an important role in this decision. Indeed, the economics literature suggests that the use of subjectively awarded promotions rather than explicit incentives is a solution to difficulties in performance measurement (Gibbons, 1998): it is a way of rewarding good performance when it is difficult to measure performance. Therefore, implicit incentives resulting from having a job and being able to develop in that job are substantial, and while their link to performance is less direct than with explicit incentives, it is very likely that performance is included in decisions on promotions.

Incentives in public sector organizations

Dixit (2002) and Burgess and Ratto (2003) review the literature on the use of incentives in public sector organizations and compare this to their use in private sector organizations. As Burgess and Ratto (2003, pp. 297–298) summarize, “[A] clear message we get from theory is that the use of performance-related incentives, and in particular of performance-related pay, is more problematic in the public sector than in the private sector. This is due to aspects such as multitasking, multiple principals, the difficulty of defining and measuring output and the issue of intrinsic motivation of workers.” Thus, the challenges with respect to using incentives relate to the characteristics of public sector work and to the characteristics of public sector workers.

The difficulties in measuring performance and identifying principals match with economic theory to explain the low take-up of explicit incentives in the public sector (Frey et al., 2013; Verbeeten & Speklé, 2015). The argument regarding worker characteristics holds that public sector employees are different in what motivates them: they identify themselves more with the organization's goals and thus are more intrinsically motivated (Buelens & Van Den Broeck, 2007). Building on Perry and

Wise (1990), a large literature has confirmed that public sector employees have higher PSM: they are more predisposed than private sector employees to contribute to public and social goals (Wright & Grant, 2010). As a result, they require less explicit financial incentives, since achieving the organization's goals is also personally rewarding for them (Francois, 2000). In addition, it is sometimes argued that the higher level of intrinsic motivation not only implies that explicit financial incentives are not useful, but that they may even be detrimental to performance (Weibel et al., 2010): when intrinsic motivation is high, performing a task is rewarding in itself. Linking external incentives to the task may result in reducing the intrinsic rewards from the task (Deci et al., 1999). When the financial incentives are not large enough to offset the reduction in intrinsic motivation, this may result in lower performance (Bellé, 2015).

Burgess and Ratto (2003) note that the empirical evidence on the use of incentives in the public sector is limited, and this holds even more for the effects of incentives. Perry et al. (2009) conclude from the empirical literature that there is no evidence that pay-for-performance in public sector settings has a positive effect. Nevertheless, there are examples of successful use of performance-based incentives in public sector organizations when the implementation issues relating to performance measurement and accountability channels can be resolved. For example, Burgess et al. (2017) study the implementation of team-based pay in a government agency responsible for placing unemployed persons into jobs and administering benefits. They find no overall effect of incentive pay, but in smaller teams, there is a positive relationship with productivity, which Burgess et al. (2017) explain from increased monitoring in small teams which reduce free riding. Such results suggest that when the setting suffers less from the complexities typically associated with public sector activities, using performance-based incentives may have a positive effect on performance.

Hypotheses

The literature on PSM has established that public sector employees are typically more predisposed than private sector employees to contribute to public and social goals (Wright & Grant, 2010) and that public sector employees with higher levels of PSM exhibit better performance in the workplace (Vogel & Homberg, 2021), as well as lower turnover intention (Hur & Abner, 2023). This in itself does not provide an argument for any differences in the effect of financial incentives: the similar levels of average pay in the public sector suggest that public sector employees value financial rewards as much as private sector employees (Lucifora & Meurs, 2006). However, since public sector employees place a value on achieving the organization's goals, meeting these goals provides an

additional nonfinancial reward to the employee (Francois, 2000). A similar argument is made by Akerlof and Kranton (2005) using the concept of organizational identity: when employees identify with the organizational goals, achieving those goals directly contributes to the employees' utility. While there is no reason to assume that public sector employees place a higher value on the financial incentives from having a job and from progressing in that job, these incentives coincide with the rewards from contributing to public goals. This may result in public sector employees requiring a lower level of incentive intensity, since there is an additional nonfinancial component to the financial rewards which are obtained when goals are achieved (Besley & Ghatak, 2005; Cassar, 2019). Furthermore, when employees place a very high value on achieving the goals of the organization, incentives may be detrimental to effort: in that case, providing explicit incentives reduces the intrinsic motivation more than the increase in external motivation from the incentives (Deci et al., 1999). When public sector employees have higher intrinsic motivation, they may be more susceptible to this crowding-out effect (Weibel et al., 2010).

Building on the PSM literature, we develop our hypotheses, starting with explicit performance-based incentives. The suggestion in the literature is that explicit financial incentives are less effective in inducing effort in public sector organizations (Frey et al., 2013). This is first because the crowding-out argument is most strongly applicable to explicit short-term incentives (Perry et al., 2009), although the evidence on whether the crowding effect occurs in empirical as opposed to experimental settings is inconclusive (Bellé, 2015). Second, given the difficulties of measuring performance in the public sector, it is possible that the instrumentality of explicit incentives is less clear: when performance measures have a weak link with employees' activities, it is not clear for employees how they must increase effort to improve performance. As a result, the relationship between incentives and effort may be less strong (Bonner & Sprinkle, 2002). Thus, we expect that explicit rewards will have a weaker effect in the public sector relative to the private sector:

H1. The relationship between performance-based incentives and effort is less positive for public sector employees relative to private sector employees.

Next, we consider the impact of pay levels. The base pay (or base wage) is the source of implicit incentives: having a job rather than none provides current rewards, while the financial rewards from career development are higher when current pay levels are higher. At higher levels of current pay, the value of future earnings is higher, not only because of the higher levels of pay but also because potential future pay increases tend to be

larger at higher levels (Baik et al., 2016). The positive direct effect of current pay levels on effort has been observed in experimental settings (Fehr & Gächter, 2000) and to a lesser extent in field settings (Cohn et al., 2015). Akerlof (1982) explains this positive effect with a reciprocity mechanism: higher pay levels result in employees feeling more highly valued by their employer, and in return, they provide effort above the contractual requirements (Avgoustaki & Bessa, 2019). For base pay to result in a different effect would require public sector employees to display higher levels of reciprocity toward the organization at similar pay levels. As noted above, PSM logic does not provide an argument: while this suggests that public sector employees derive personal rewards from achieving the organization's goals (Francois, 2000; Wright & Grant, 2010), it does not follow that they should place a higher value on financial rewards. However, when an increase in pay is a proxy for having a more interesting and impactful position, this may result in an increase in the nonfinancial reward component for public sector employees and thus in a higher total incentive intensity (Besley & Ghatak, 2005). At the same time, base pay is a highly visible financial reward, and its salience is such that the link to career progression may be overshadowed. That is, the short-term effects of base pay may be stronger than the long-term implicit effects which will accrue through career progression. Thus, we expect the following:

H2. The relationship between pay level and effort is not different or more positive for public sector employees relative to private sector employees.

We next address the argument that since public sector employees are motivated by contributing to achieving the organization's goals, they react more strongly to financial incentives that result from having their job and progressing in that job due to the additional rewards of contributing to organizational goals (Besley & Ghatak, 2005; Cassar, 2019). First, hard work and putting in long hours may be seen as a requirement for progress in the job. The effort-inducing effect of promotions is supported by Bell and Freeman (2001) who find that employees report working longer hours when they expect a promotion in the next 2 years. While this provides an incentive in both sectors, when the link between hard work and progress in the job is more salient, this also means that the hard work is more explicitly linked to a higher level job which will likely be more interesting and will offer more opportunities to contribute to the organizational goals (LeRoux & Pandey, 2011). This suggests that the motivational impact of rewarding long hours with promotions will be higher for public sector employees. Furthermore, Bidwell and Mollick (2015) find that progressing into a job with greater responsibilities is much more likely to happen within an organization than

by moving to a new organization, even while pay changes are similar for internal and external job changes: the move to a new organization results in a job with comparable responsibilities but at a higher pay level, whereas internal progression results in both more responsibilities and higher pay. Public sector employees will place more value on this within-organization route since in these higher level jobs, they can contribute even more to the organization's goals, rather than moving to an external organization for similar higher pay levels but with less increase in responsibility. This leads to our third hypothesis:

H3. The relationship between effort as a promotion criterion and (actual) effort is more positive for public sector employees than for private sector employees.

Next, employees may experience different levels of job security. From a reciprocity perspective, employees may increase their effort with increased job security since the value of their current and future earnings is more certain and thus higher (Fehr & Gächter, 2000). Similar to the main effect of base pay (H2), there is no reason to assume that public sector employees will exhibit a stronger reciprocity effect toward this increased value of future earnings. However, from an agency-theoretic perspective, job security reduces the risk of a negative effect on rewards in case of lower performance, and this may dull effort (Prendergast, 1999). This effect will be less negative when employees are more highly intrinsically motivated and attach more value to achieving organizational goals. This argument mirrors the crowding-out argument (Weibel et al., 2010): when the link between performance and financial incentives is less direct, the impact of reaching the organizational goals will be greater. We therefore expect the following:

H4. The relationship between job security and effort is more positive for public sector employees than for private sector employees.

Finally, satisfaction with current pay levels may have both positive and negative effects from a motivational perspective. On the one hand, if it reflects that employees receive a fair pay for a fair day's work, they will feel valued, and this may motivate them to put in more effort, which ties into the reciprocity effect of Akerlof (1982). On the other hand, pay satisfaction may be the result of employees feeling that they do not have to work too hard relative to their pay level; in other words, employees who have to put in more effort will feel less satisfied with their pay. Thus, there is some inherent endogeneity in the relationship between pay satisfaction and effort. Nevertheless, using the PSM logic, the relationship between pay satisfaction and effort should be more positive for public sector employees under both mechanisms: at a similar

level of pay satisfaction, the intrinsic value of the job activities should work as an additional positive motivational mechanism for public sector employees. Our final hypothesis is as follows:

H5. The relationship between pay satisfaction and effort is more positive for public sector employees than for private sector employees.

RESEARCH SETTING

Data

We use the 2011 version of the Workplace Employment Relations Survey or WERS (Department for Business, Innovation and Skills, 2013). The 2011 WERS project is the sixth wave in a series of national surveys of employment relations at the workplace level in the United Kingdom. Its target population is all workplaces with five or more employees in all sectors excluding agriculture, fishing, and mining. The study setup involves an interview with the workplace's senior manager responsible for employment relations during which an extensive questionnaire is completed, as well as a survey that is distributed to up to 25 employees at the workplace. The response rates are high, at 46 percent for managers and 54 percent for employees, and the survey data have been used to investigate a multitude of questions on issues such as workplace relations, employee representation, flexible work practices, health and safety, and job satisfaction (see WERS, 2020). The 2011 version has data from 2680 workplace managers and from 21,981 employees.

Variables

The sector (public or private) is taken from the survey aimed at workplace managers; all other items are taken from the employee survey. The exact wording of the items in the WERS instrument is in Appendix A (Table A1).

As a proxy for effort, we follow Engellandt and Riphahn (2005) and measure effort with the amount of unpaid overtime. Grant (2008) notes that overtime is a measure of persistence, indicating that employees are willing to invest time and energy in their tasks to perform effectively. Respondents report their actual hours and their contractual hours, and they indicate whether they are compensated for additional hours of work; by excluding those respondents who receive overtime compensation, we ensure that any reported overtime is unpaid rather than being a means of increasing pay directly. The dependent variable relative overtime is calculated as the ratio of actual and contractual hours per week (multiplied by 100 to facilitate interpretation of the regression coefficients). We restrict the sample to a range of relative overtime between 80 and 200, representing actual

working hours of 80 percent up to 200 percent of contractual hours. At the lower end, working less than 80 percent of contractual hours while getting paid for all hours is not likely to be a long-term situation. Similarly, at the higher end working more than double the hours for the same pay is extreme in normal positions. Additionally, because relative overtime is a ratio, small denominators can lead to very high ratios, resulting in outliers.

Employees indicate whether they receive payments based on individual performance, the overall performance of a group or team, or the overall performance of the workplace or organization; they do not report the magnitude of any payments. We use a bonus indicator which is 1 if respondents receive one or more of these bonus types. In addition, employees indicate their basic pay level by ticking one of 14 ranges, from less than £3120 per year to more than £54,600 per year. We exclude employees who indicate that do not receive a basic fixed salary, since this implies a zero-hour contract (Farina et al., 2020) or a commission only contract.

The importance of effort as a criterion to achieve promotion is measured by a single item that asks for respondents' evaluation of the extent to which it is important to put in long hours to progress in their work such as through a promotion, and job security is measured with a single item asking respondents whether they feel that their job is secure in this workplace. Pay satisfaction is measured by a single item measuring the extent to which respondents are satisfied with the amount of pay they receive.

We use various indicators to control for differences in the characteristics of public and private sector employees. Lucifora and Meurs (2006) show that pay differences between public and private sector employee are affected by gender, experience, and education. Experience is proxied by age and education by a graduate indicator for an academic degree (bachelor or higher). Additionally, we include several constructs from the WERS instrument which reflect potential other motivating mechanisms. These constructs conceptually are less or not dependent on current and future pay levels and as such do not work through the mechanism of implicit incentives. However, their motivational effect may explain effort levels. First, employee empowerment—the extent to which employees have influence on how they perform their tasks—has been suggested as a motivating mechanism for employees, leading to increased effort (Spreitzer, 1995). Since the survey is aimed at the operational level, empowerment is operationalized in the form of task-level autonomy resembling items from Breaugh (1989) with an α of .85. Second, organizational commitment may lead to increased effort and higher performance: more committed employees value the organization's goals and will engage more to achieve these goals (Mathieu & Zajac, 1990). Organizational commitment is measured with three items taken from Mowday et al. (1979) with an α of .85. Third, job satisfaction may

lead to more effort and higher performance through a more positive attitude of the employee toward their work. While the literature has established a positive relation between satisfaction and performance, there is no consensus on the underlying mechanism: higher performance may also lead to higher satisfaction because it results in both psychological and financial rewards (Judge et al., 2001). Job satisfaction is measured with six items that are specific to the WERS questionnaire (Bryson et al., 2017) with an α of .88.

Finally, we control for contract and job characteristics. We include an indicator for a part-time position and for having a permanent position. There is no consensus on the number of hours defining part-time work. We follow the OECD (Roeters & Craig, 2014) and Conway and Sturges (2014) and define part-time work as 30 contractual hours per week or less; inferences are similar when using cut-offs of 35 or 40 h per week. The indicator for a temporary job is based on respondents' own classification of their position as permanent or temporary. The nature

of the job is assessed based on respondents' description of their job, which is classified by WERS coders into one of the nine occupational categories which the UK Office for National Statistics identifies, such as professional occupations, Administrative and secretarial occupations, and Skilled trades (Office for National Statistics, 2016). Employees in each of these categories may differ in their skills, education, and labor market positions. By including dummy variables for each of these categories, we control for their differential incidence in each sector.

After dropping observations with missing values, our final sample has 10,764 observations from 1797 workplaces: 4220 employees from 612 public sector workplaces, and 6544 employees from 1185 private sector workplaces.

In Table 1, we provide descriptives for the whole sample, and for the two sectors; we also report whether there is a difference between sectors using a *t*-test and a non-parametric Kruskal–Wallis test. On average, both public and private sector employees report overtime of some 10 percent of their contractual hours. The mean for public

TABLE 1 Descriptive statistics for the full sample and for the private and public sector subsamples.

	Full sample (N = 10,764)					Private (N = 6544) Mean	Public (N = 4220) Mean	Significance of public vs. private	
	Mean	SD	Min	Med	Max			t-test	K-W
Relative overtime	110.297	16.039	80	103.333	200	109.891	110.927	***	*
Overtime hours	3.501	5.411	-10	1	42	3.483	3.530	n.s.	n.s.
Public	0.392	0.488	0	0	1	0.000	1.000		
Bonus	0.160	0.367	0	0	1	0.229	0.054	***	***
Pay	8.965	3.248	1	9	14	9.040	8.848	***	***
Promotion criterion	3.292	1.000	1	3	5	3.321	3.248	***	***
Job security	3.428	1.119	1	4	5	3.597	3.165	***	***
Pay satisfaction	3.049	1.123	1	3	5	3.103	2.964	***	***
Female	0.583	0.493	0	1	1	0.518	0.684	***	***
Age	5.777	1.305	1	6	9	5.649	5.976	***	***
Graduate	0.402	0.490	0	0	1	0.385	0.427	***	***
Autonomy	3.263	0.719	1	3.5	4	3.336	3.149	***	***
Job satisfaction	3.691	0.759	1	3.833	5	3.733	3.627	***	***
Commitment	3.863	0.801	1	4	5	3.915	3.782	***	***
Part-time position	0.234	0.424	0	0	1	0.195	0.295	***	***
Temporary position	0.065	0.247	0	1	1	0.060	0.073	***	***
Occupational group									
Managers/seniors	0.094	0.292	0	0	1	0.123	0.049	***	***
Professionals	0.230	0.421	0	0	1	0.188	0.295	***	***
Associate professionals	0.195	0.396	0	0	1	0.208	0.176	***	***
Administrative	0.206	0.405	0	0	1	0.182	0.245	***	***
Skilled trades	0.038	0.191	0	0	1	0.053	0.014	***	***
Caring/leisure	0.094	0.292	0	0	1	0.072	0.128	***	***
Sales	0.042	0.201	0	0	1	0.057	0.020	***	***
Machine operators	0.026	0.159	0	0	1	0.037	0.009	***	***
Elementary positions	0.074	0.262	0	0	1	0.081	0.064	***	***

Note: The column *t*-test reports the significance of comparing private and public sector means using a *t*-test, while the column K-W reports the significance of a nonparametric Kruskal–Wallis test. Significances *, **, and *** are $p < .1$, .05, and .01, respectively, n.s. not significant.

TABLE 2 Correlations.

	Over	Publ	Bon	Pay	Prom	Sec	PayS	Fem	Age	Grad	Aut	Jobs	Comm
Relative overtime	1.000												
Public	0.032	1.000											
Bonus	0.088	-0.233	1.000										
Pay	0.321	-0.029	0.314	1.000									
Promotion criterion	0.231	-0.036	0.073	0.149	1.000								
Job security	0.057	-0.188	0.052	-0.040	-0.012	1.000							
Pay satisfaction	0.069	-0.060	0.111	0.209	-0.035	0.234	1.000						
Female	-0.073	0.164	-0.162	-0.289	-0.047	0.018	-0.002	1.000					
Age	0.020	0.122	-0.024	0.103	-0.095	-0.058	0.024	-0.036	1.000				
Graduate	0.250	0.043	0.109	0.412	0.156	-0.016	0.085	-0.074	-0.090	1.000			
Autonomy	0.069	-0.127	0.086	0.196	-0.044	0.217	0.238	-0.025	0.036	0.070	1.000		
Job satisfaction	0.071	-0.068	0.031	0.043	-0.052	0.405	0.422	0.033	0.038	0.006	0.493	1.000	
Commitment	0.131	-0.081	0.055	0.084	0.008	0.354	0.346	0.050	0.026	0.067	0.344	0.601	1.000
Part-time position	-0.051	0.115	-0.162	-0.596	-0.058	0.041	0.005	0.276	0.078	-0.132	-0.088	0.032	0.019
Temporary position	-0.012	-0.027	0.074	0.127	-0.012	0.101	-0.025	-0.003	0.115	-0.026	0.025	-0.032	-0.023
Managers/seniors	0.140	-0.124	0.163	0.267	0.011	0.041	0.112	-0.112	0.079	0.054	0.166	0.112	0.129
Professionals	0.309	0.124	0.012	0.374	0.192	0.016	0.113	-0.032	-0.001	0.430	0.056	0.060	0.056
Associate professionals	-0.030	-0.039	0.123	0.173	0.002	-0.064	-0.002	-0.074	-0.056	0.097	0.057	-0.024	0.006
Administrative	-0.187	0.076	-0.071	-0.184	-0.122	-0.083	-0.062	0.204	0.017	-0.182	-0.067	-0.115	-0.086
Skilled trades	-0.057	-0.102	-0.024	-0.015	-0.018	0.004	-0.021	-0.175	0.003	-0.100	0.007	-0.003	-0.050
Caring/leisure	-0.093	0.093	-0.122	-0.341	-0.047	0.062	-0.100	0.173	-0.008	-0.183	-0.072	0.074	0.049
Sales	-0.046	-0.088	-0.005	-0.171	-0.004	0.027	-0.028	0.051	-0.079	-0.103	-0.075	-0.036	-0.025
Machine operators	-0.051	-0.084	-0.036	-0.051	-0.049	0.023	-0.034	-0.145	0.048	-0.112	-0.047	-0.033	-0.070
Elementary positions	-0.108	-0.031	-0.099	-0.325	-0.036	0.047	-0.038	-0.045	0.011	-0.193	-0.096	-0.037	-0.067
Part-time position	1.000												
Temporary position	-0.091	1.000											
Managers/seniors	-0.133	0.050	1.000										
Professionals	-0.087	-0.025	-0.176	1.000									
Associate professionals	-0.115	0.013	-0.159	-0.269	1.000								
Administrative	0.057	0.006	-0.165	-0.279	-0.251	1.000							
Skilled trades	-0.063	0.015	-0.064	-0.109	-0.098	-0.098	1.000						
Caring/leisure	0.210	-0.035	-0.104	-0.176	-0.159	-0.104	-0.164	1.000					
Sales	0.077	-0.018	-0.068	-0.115	-0.104	-0.104	-0.107	-0.042	1.000				
Machine operators	-0.061	0.000	-0.053	-0.089	-0.080	-0.080	-0.083	-0.032	-0.068	1.000			
Elementary positions	0.164	-0.004	-0.091	-0.155	-0.139	-0.139	-0.144	-0.056	-0.053	-0.034	1.000		
												1.000	
													1.000

Note: N = 10,764, correlations with absolute value of 0.025 and higher are significant at 0.01.

sector employees is significantly higher, but the magnitude of the difference is small (110.9 vs. 109.9). For descriptive purposes, we also report the overtime hours: here the averages are similar at 3.5 h per week. The significant difference in the relative overtime occurs because public sector employees' average contractual hours are lower. All independent variables are significantly different at $p < .01$ between the public and private sectors. This is partly driven by the large number of observations, but it also reflects meaningful differences. This is especially apparent with the use of explicit incentives, which is rare in the public sector with an incidence of only 5.4 percent, although it is also far from universal in the private sector at 22.9 percent. Job security is substantially lower in the public sector, which does not match previous findings (e.g., Erlinghagen, 2008). This may be due to the survey's time frame: in 2011, the United Kingdom was, like other economies, in recession, and the UK government responded with deep cuts to public services (Kiefer et al., 2015). Finally, we note that the control variables also show substantial differences, with a much higher share of females in the public sector employees (68 percent vs. 52 percent), while public sector employees are older and more often have a degree. Furthermore, private sector employees report higher autonomy, job satisfaction, and organizational commitment, which is consistent with previous literature (Chen, 2012).

Analytical strategy

Since the data has a hierarchical structure, with employees nested within workplaces, we cannot use straightforward ordinary least squares (OLS) regressions. We therefore use multilevel modeling with random effects at the workplace level; specifically, we use the *mixed* command with maximum likelihood estimation in Stata 17.0. The hierarchical structure can also be accounted for using an OLS regression with standard errors clustered by workplace (Antonakis et al., 2021; Cameron & Miller, 2015); when we use clustered standard errors inferences are highly similar (untabulated).

In addition to the modeling approach to reflect the data structure, we need to take into account that employees vary in the nature of their contract (temporary vs. permanent) and in the number of contractual hours per week. This may confound the following analyses: Engellandt and Riphahn (2005) find that temporary staff exert more effort as measured by unpaid overtime than permanent staff, and Conway and Sturges (2014) find that employees in part-time positions have more unpaid overtime hours than full-time staff. For these employees, working overtime may also be an investment to obtain a permanent position or a position offering more hours. While these are financial rewards, it is not clear whether extending hours or gaining a permanent position is a reward that is available to all part-time and temporary

employees. We therefore run our models on the full sample and on the subsample of employees on a full-time, permanent contract.

Finally, the correlations in Table 2 suggest that differences between public and private sector employees may impact the findings with respect to the effect of incentives. For example, in Table 1, we observed that public sector employees are more often females. Table 2 shows that females are paid less ($r = -.289$), and that pay is positively related with overtime ($r = .231$); thus, any relationship between public sector and overtime may be due to the relatively higher share of less well-paid female employees. To account for the differences between public and private sector employees, we extend our analyses with a propensity score matching approach (Bryson et al., 2017; Li, 2013). We use the *psmatch2* procedure available in the Stata analytical software (Leuven & Sianesi, 2003) to match on all independent variables, using one-to-one nearest neighbor probit matching without replacement and a caliper of 0.01 in both the full sample and the subsample of full-time permanent employees. The matching procedure ensures that the matched regression sample is not different for public and private sector employees with respect to the independent variables. This means that in each matched sample, the share of females among public and private sector employees does not differ significantly, or the average level of pay, or the use of bonuses, or any of the other independent variables.

RESULTS

We present our main results in Table 3. As expected, part-time employees and employees who are on a temporary contract report more overtime, suggesting that these contract characteristics provide a direct incentive to increase effort.

In the main effects models (1) and (3), we see similar direct effects in terms of signs and significance for the independent variables used to evaluate the hypotheses. The coefficient for the public sector indicator is significantly positive, suggesting that public sector employees provide more effort through unpaid overtime. The effects of base pay, effort as a promotion criterion, and job security are positive. Pay satisfaction has a negative coefficient, so employees who are less satisfied with their pay put in more unpaid overtime. Among the demographic control variables, education has a significant positive coefficient, while age is not related with overtime. The female indicator is negatively related to overtime in the full sample, but not in the subsample of full-time employees in a permanent position. Among the motivational mechanisms, commitment has a significant positive effect. Somewhat surprisingly, autonomy is significantly negatively related to effort. This may be because employees use their autonomy to reduce their efforts, but it is also possible that the autonomy allows them to do their work more effectively, reducing the need for overtime.

TABLE 3 Results from hierarchical linear model regression with random effects per workplace.

	Full sample		Full-time employees in permanent position	
	(1)	(2)	(3)	(4)
Constant	84.673***	89.624***	77.787***	83.007***
Public sector	0.940**	-1.299***	1.037**	-11.396***
Bonus	0.096	0.827*	-0.010	0.497
Pay level	1.604***	1.460***	2.108***	2.010***
Promotion criterion	2.038***	1.678***	2.037***	1.702***
Job security	0.502***	-0.097	0.579***	-0.180
Pay satisfaction	-0.752***	-0.974***	-0.921***	-1.134***
Public × bonus		-1.609		-1.524
Public × pay level		0.393***		0.274*
Public × promotion criterion		0.746***		0.734**
Public × job security		1.188***		1.716***
Public × pay satisfaction		0.511*		0.575*
Female	-0.591*	-0.707**	0.015	-0.106
Age	-0.168	-0.181	-0.135	-0.156
Graduate	1.277***	1.186***	1.017***	0.966***
Autonomy	-0.380*	-0.375*	-0.535**	-0.543**
Job satisfaction	0.020	0.037	-0.031	0.013
Commitment	1.473***	1.548***	1.617***	1.667***
Part-time position	5.975***	6.119***		
Temporary position	2.063***	2.114***		
Job categories				
Managers/seniors	5.658***	5.754***	5.217***	5.234***
Professionals	5.876***	5.605***	4.190***	3.967***
Administrative	-1.210***	-1.037**	-0.631	-0.460
Skilled trades	-1.010	-1.038	-0.148	-0.289
Caring/leisure	-0.590	-0.324	0.964	1.071
Sales	1.555*	1.401*	1.228	1.262
Machine operators	0.630	0.569	1.252	1.121
Elementary positions	0.075	0.108	0.302	0.261
Wald χ^2	2673.67	2749.31	2257.71	2348.08
<i>p</i>	.000	.000	.000	.000
Number of workplaces	1797		1665	
Average employees per workplace	6.0		4.7	
Observations	10,764		7808	

Note: Dependent variable is relative overtime: $100 \times (\text{actual hours}/\text{contract hours})$. Reference job category is associate professionals. Significances *, **, and *** are $p < .1$, .05, and .01, respectively.

Finally, the job category indicators show that unpaid overtime is more prevalent among managers and professionals, while the other categories are largely comparable.

Models (2) and (4) include the interaction variables with the public sector dummy. The pattern is similar for the full sample and the subsample of full-time employees in a permanent position, although the significance levels are somewhat lower in the subsample. We see that the interaction with the bonus indicator is negative, but not significant. Thus, we find no support for H1, which states that public sector employees increase effort less than private sector

employees when receiving a bonus. The coefficient on pay scale is significantly positive, providing strong support for H2: The relationship of base pay levels with effort is more positive for public sector employees. For H3, H4, and H5, we also find support: relative to private sector employees, public sector employees provide more effort when it is an important promotion criterion, when they perceive higher job security and have higher levels of pay satisfaction.

In Table 4, the regressions are run again, but now using matched samples. As indicated, the matched samples are constructed in such a way that the means of the

TABLE 4 Results from hierarchical linear model regression with random effects per workplace using matched samples.

	Matched full sample		Matched full-time employees in permanent position	
	(1)	(2)	(3)	(4)
Constant	84.248***	91.363***	78.982***	86.726***
Public sector	1.302***	-12.001***	0.944*	-13.846***
Bonus	-0.915	-0.881	-0.206	0.454
Pay level	1.424***	1.258***	1.947***	1.852***
Promotion criterion	2.148***	1.646***	2.205***	1.453***
Job security	0.529***	-0.486*	0.760***	-0.429
Pay satisfaction	-0.629***	-0.869***	-0.769***	-0.974***
Public × bonus		0.416		-1.023
Public × pay level		0.370***		0.198
Public × promotion criterion		0.815**		1.373***
Public × job security		1.789***		2.173***
Public × pay satisfaction		0.469		0.387
Female	-0.317	-0.389	0.168	0.101
Age	0.006	-0.037	-0.208	-0.243
Graduate	1.653***	1.561***	1.402***	1.334***
Autonomy	-0.515*	-0.466*	-0.752**	-0.728**
Job satisfaction	0.168	0.159	-0.309	-0.282
Commitment	1.295***	1.367***	1.662***	1.735***
Part-time position	5.101***	5.190***		
Temporary position	2.156***	2.168***		
Job categories				
Managers/seniors	5.021***	4.752***	6.203***	6.026***
Professionals	6.894***	6.723***	5.414***	5.268***
Administrative	-0.876	-0.728	-0.488	-0.320
Skilled trades	0.311	0.310	1.250	1.107
Caring/leisure	0.612	0.709	1.480	1.501
Sales	0.223	0.163	1.370	1.600
Machine operators	0.130	0.137	3.079*	3.279*
Elementary positions	-0.590	-0.494	0.055	0.007
Wald χ^2	1685.664	1758.143	140.894	1485.771
<i>p</i>	.000	.000	.000	.000
Number of workplaces	1587		1381	
Average employees per workplace	4.2		3.3	
Observations	6654		4576	

Note: Dependent variable is relative overtime: $100 \times (\text{actual hours}/\text{contract hours})$. Reference job category is associate professionals. Significances *, **, and *** are $p < .1$, .05, and .01, respectively.

independent variables are not different between public and private sectors. This reduces the risk that the results are driven by employee characteristics being different between the two sectors. The patterns for the direct effects and the control variables are very similar, with the coefficient on the public sector dummy remaining positive in models (1) and (3). The exception is the coefficient on the female indicator, which is now no longer significant. Turning to the hypotheses, the support for H2 is somewhat weaker using the matched sample with only a significant positive coefficient in model (2). H5 does not receive support, although the

magnitude of the coefficients on the interaction between public sector and pay satisfaction is similar to that in Table 3. H3 and H4 continue to receive strong support: public sector employees react more positively when effort is rewarded with a promotion and when their job is more secure.

DISCUSSION

This article investigates the relationship between financial compensation and effort for public and private sector

employees. While theory suggests that this relationship may be different between the sectors (Cassar, 2019), there is little empirical evidence on this relationship. Measuring effort as the relative amount of unpaid overtime, we find that public sector employees have significantly higher overall effort levels than private sector employees. Public sector employees do not react differently to performance-related rewards and somewhat more positive to an increase in base pay levels. The effects of effort as a promotion criterion, job security, and to a lesser extent pay satisfaction are more positive for public sector employees, which suggests that they are motivated by implicit financial incentives to a larger extent than private sector employees. We next discuss the theoretical and practical implications of these findings.

From a theoretical perspective, we articulate how the effect of implicit incentives can differ between public and private sector employees. The underlying mechanism for this is well known and relies on the assumption that public sector employees derive value from achieving the organization's goal to a larger extent than private sector employees do (Francois, 2000). A naïve interpretation of this mechanism would suggest that public sector employees require a lower level of financial incentives to put in the same amount of effort. However, this does not match with the observation that public sector pay is similar or higher in OECD countries, also after controlling for employee characteristics (Lucifora & Meurs, 2006). We identify when implicit incentives may have a positive effect and provide empirical evidence that provides substantial support for our expectations. Building on the notion that public sector employees are more likely to find more meaning and value in their jobs (Perry & Wise, 1990), maintaining and improving pay levels coincides with contributing to the organization's goals for public sector employees, which might reinforce the effects of these implicit incentives (Cassar, 2019). Additionally, progressing within the organization will be more rewarding for intrinsically motivated employees since at higher job levels, employees typically have more impact on achieving the organization's goals (Bidwell & Mollick, 2015).

We do not find a negative effect of explicit incentives for public sector employees relative to private sector employees: public sector employees do not exert less effort when they receive a bonus. This means that we do not find support for the crowding-out argument, which states that providing external incentives reduces the intrinsic motivation from the task itself (Deci et al., 1999). However, we note that the incidence of bonuses in the public sector is very low (5.4 percent in the full sample). This may imply that public sector jobs where bonuses are used are different from most public sector jobs and therefore not well suited to test the crowding-out argument.

We do find moderate to strong support for the hypotheses concerning implicit incentives: public sector employees increase effort more than private sector employees when pay levels are higher, when effort is perceived to be more important to obtain promotions, when the perceived job

security is higher, and when satisfaction with pay is higher, although the results are weaker when using matched samples. While these results map into our hypotheses, an argument can be made for alternative mechanisms. Specifically, when performance-based rewards are much less used, implicit incentives from progressing in the job will be more salient since this is the only way to increase pay. In this argument, the stronger effect of implicit incentives in the public sector is not due to the nonfinancial pay-off of contributing to the organization's goals, but to the absence of explicit rewards. However, the incidence of bonuses is also limited for private sector employees at 22.9 percent (see Table 1). Furthermore, the analyses in Table 4 use a matched sample, where the bonus incidence is similar for the two sectors, and the results are similar. Indeed, when we redo the analyses excluding all observations in the public and in the private sector with a bonus, we get similar results in terms of signs and significances (untabulated). Nevertheless, the survey asks whether performance-related bonuses have been received rather than whether respondents are eligible for bonuses, and as a result, the importance of explicit rewards in the private sector may be underestimated. While this also holds for the public sector, the much lower incidence of received bonuses makes it unlikely that bonus eligibility is similar in the public sector relative to the private sector (Burgess & Ratto, 2003).

In addition to the theoretical contribution, we contribute to the limited body of empirical evidence on the relationship between incentives and effort at the level of rank-and-file employees, especially in the public sector. As Larkin et al. (2012) note, this evidence is heavily skewed toward arguably idiosyncratic samples of CEOs, salespersons, and professional athletes. By using unpaid overtime as the measure of effort, we can compare the effects of incentives in our sample. While unpaid overtime has been used before as effort indicator (Conway & Sturges, 2014), it has not been linked to explicit and implicit financial incentives.

Third, the data we use has an unusual combination of detailed information on incentives and employee-level characteristics. Even while we do not have information on bonus intensity, the bonus incidence and especially the pay level provide a relatively complete picture of the financial incentives. This enables us to include implicit incentives in our analyses, which is not feasible when pay levels are not available.

Practical implications

The results help in understanding how incentives in the public sector have similar and different effects on employees relative to the private sector. While the difficulties of applying pay-for-performance and the differences in intrinsic motivation may help in understanding the different structuring of incentives (Burgess & Ratto, 2003), public sector organizations do offer financial incentives to their employees at comparable levels to the private sector. By emphasizing the difficulties of explicit

incentives (Frey et al., 2013), the effects of implicit incentives are somewhat overlooked. Our results show that similar to private sector employees, public sector employees increase effort at higher pay levels. However, public sector employees react more positively to implicit incentives: they do not value financial rewards as such less, but they place a higher value on being able to progress within their organization, on job security, and on a satisfactory pay level.

We also note that even while the relationship between implicit financial incentives and effort is stronger for public sector employees, the employee characteristics do not necessarily suggest a higher level of intrinsic motivation for public sector employees. Indeed, as shown in Table 1, private sector employees are more satisfied with their job and their pay, have a higher level of organizational commitment, and feel more empowered (as indicated by their perceived autonomy), consistent with previous findings (Chen, 2012). However, this does not lead to public sector employees providing less effort, as evidenced by the levels of unpaid overtime. This may suggest that public sector employees are indeed more committed to the organization's goals rather than the job within the organization itself: while they may value acting in the interests of the citizen, the patient, or the student, this does not mean that the characteristics of the employment relationship or the organizational circumstances are experienced as being better.

Limitations

Our empirical setting has important advantages, but it also has limitations. First, the results are based on cross-sectional self-reported numbers, with the dependent variable coming from the same source as the explanatory variables. This raises concerns with respect to common method bias. In this respect, our hypotheses are tested using interaction models, and Siemsen et al. (2010) have established that interaction models do not suffer from common method bias risk. In addition to the common method bias, public sector employees may systematically differ from private sector employees in their reporting of overtime relative to their actual overtime: public sector employees may systematically report higher levels of overtime than they actually work, whereas private sector employees do not do this. However, observing a significant positive interaction between the public sector indicator and for example job security when it is due to misreporting would require that public sector employees who experience a higher level of job security systematically misreport their overtime differently from public sector employees who experience lower job security. This should also be the case for the other significant interactions. We find it difficult to develop arguments explaining why public sector employees would misreport their overtime differently from private sector employees and even more so for systematic differences within the group of

public sector employees (cf. Conway & Sturges, 2014). While we cannot rule out that systematic differences between the two sectors in reporting overtime are present, we think that it is unlikely that they cause our findings.

A second limitation is that endogeneity may be present with respect to relationship of several of the independent variables with overtime. The relationship between pay level and overtime may arise because higher pay is awarded more often to harder working employees, which implies that higher overtime is not driven by pay levels but that pay levels are the result of high overtime. Similarly, as discussed in developing H5 on the relationship between pay satisfaction and overtime, overtime might have a negative effect on pay satisfaction: employees who put in more unpaid overtime hours might be less happy with their pay than employees who do not need to do this, which fits with the negative direct coefficients on pay satisfaction in Tables 3 and 4. However, we are not basing our inferences on the direct effects as such but on whether the relationship with pay level or pay satisfaction is different for public and private sector employees. If the causal relationship runs from effort to pay level, a significant positive interaction term for the public sector dummy indicates that public sector employees work harder to get to the same pay level. Similarly, if effort is a driver of pay satisfaction, a significant positive interaction for the public sector dummy means an increase in effort has a less negative effect for public sector employees: employees are less satisfied when they have to work harder for the same pay, but this effect is less negative in the public sector. Both interpretations are consistent with our theoretical development.

Third, the analysis is opportunistic in that it is necessarily limited to the measures included in the survey. For example, we do not know the magnitude of the explicit incentives, the extent to which these incentives are linked to actual performance measures or are dependent on subjective (nonenforceable) managerial assessments, or the increase in pay for a promotion, nor do we have information on the political attitudes of employees and organizations. Furthermore, we rely on single-item indicators for several theoretical constructs. However, the number of observations is substantial, and respondents come from a very large number of different workplaces. This implies that individual organizational or occupational idiosyncrasies are unlikely to impact the results.

Fourth, the database does not allow us to identify respondents in not-for-profit organizations. However, the limited theoretical and empirical evidence regarding incentives and effort among not-for-profit employees suggests that they are more similar to public sector employees than to private sector employees in their job motivation (Chen, 2012). The data are structured in such a way that any not-for-profit observations are included among the private sector observations. Should not-for-profit employees make up a substantial part of the private sector observations in our sample, this would then

work against finding differences between the two sectors. Thus, while it is unfortunate that we cannot extend the comparison to the not-for-profit sector, it is unlikely that that our statistical inferences regarding the difference between public sector and private sector employees are driven by not-for-profit employees.

A fifth and final limitation is that the data only allow us to identify effort (in the form of duration) rather than outcomes. While using effort allows for a comparison across very heterogeneous settings, the ultimate goal of incentive systems is to ensure employees contribute to reaching the organization's goals (Sandvik et al., 2021).

CONCLUSION

While the difficulties of pay-for-performance in the public sector are well known, financial incentives are an important management tool for public sector organizations, with average public sector pay somewhat or substantially higher than average private sector pay in many countries. By emphasizing the difficulties of using explicit incentives in the form of pay-for-performance in the public sector, the overall effect of financial incentives is somewhat overlooked. Our results suggest that explicit incentives are not different in their ability to elicit effort in the public sector, while implicit incentives that are aligned with contributing to organizational goals are more effective. The stronger links between implicit incentives and effort in the public sector map well into the public sector motivation logic, but they also caution against assuming that financial incentives have little or even negative effects in the public sector.

ACKNOWLEDGMENTS

The author thanks seminar participants at University of Amsterdam and the 2019 AAA MAS meeting and to Frank Belschak, Jan Bouwens, Brendan O'Dwyer, Ruidi Shang, David Veenman, and Marc Wouters for helpful comments.

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How to cite this article: van Triest, Sander. 2024. "Incentives and Effort in the Public and Private Sector." *Public Administration Review* 84(2): 233–247. <https://doi.org/10.1111/puar.13691>

APPENDIX A

TABLE A1 Survey items.

Variable	Measurement
Effort	
Contractual hours	What are your basic or contractual hours each week in your job at this workplace, excluding any paid or unpaid overtime?
Actual hours	How many hours do you usually work in your job each week, including overtime or extra hours?
Incentives	
Bonus	Which of the following do you receive in your job here? Payments based on your individual performance or output Payments based on the overall performance of a group or team Payments based on the overall performance of your workplace or organization (e.g., profit-sharing scheme)
Pay	How much do you get paid for your job here, before tax and other deductions are taken out? If your pay before tax changes from week to week because of overtime, or because you work different hours each week, think about what you earn on average (1) Less than £3120, (2) £5200, (3) £6760, (4) £8840, (5) £11,400, (6) £13,520, (7) £16,120, (8) £19,240, (9) £22,360, (10) £27,040, (11) £33,800, (12) £42,640, (13) £54,600, (14) More than £54,600
Promotion criterion	Think about how people in your kind of job progress—for example, get a promotion. Do you agree or disagree that people in this workplace who want to progress usually have to put in long hours? (1 = strongly disagree, 5 = strongly agree)
Job security	I feel my job is secure in this workplace (1 = strongly disagree, 5 = strongly agree)
Pay satisfaction	How satisfied are you with the amount of pay you receive? (1 = very dissatisfied, 5 = very satisfied)
Controls	
Age	How old are you? (1) 16–17, (2) 18–19, (3) 20–21, (4) 22–29, (5) 30–39, (6) 40–49, (7) 50–59, (8) 60–64, (9) 65 and above
Autonomy	In general, how much influence do you have over the following (1 = none, 4 = a lot); Cronbach $\alpha = .85$ The tasks you do in your job The pace at which you work How you do your work The order in which you carry out your tasks
Job satisfaction	How satisfied are you with the following aspects of your job (1 = very dissatisfied, 5 = very satisfied); Cronbach $\alpha = .88$ The sense of achievement you get from your work The scope for using your own initiative The amount of influence you have over your job The training you receive The opportunity to develop your skills in your job The work itself
Organizational commitment	To what extent do you agree or disagree with the following statements about working here (1 = strongly disagree, 5 = strongly agree); Cronbach $\alpha = .85$: I share many of the values of my organization I feel loyal to my organization I am proud to tell people who I work for
Temporary position	Which of the phrases below best describes your job here? (1) permanent, (2) temporary—with no agreed end date, (3) fixed period—with an agreed end date
Occupational category	Describe what you do in your main job Open question, answer is classified by WERS coders into 1 of 9 Office of National Statistics categories: (1) Managers, directors, and senior officials, (2) Professional occupations, (3) Associate professional and technical occupations, (4) Administrative and secretarial occupations, (5) Skilled trades (6) Caring, leisure, and other service occupations, (7) Sales and customer service occupations, (8) Process, plant and machine operatives, (9) Elementary occupations.