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This is a copy of the accepted author manuscript of the following article: White, M. and Smeaton, D. (2016) Older employees' declining attitudes over 20 years and across classes. *Human Relations*, 69 (8), pp. 1619-1641. The final definitive version is available from the publisher Sage at:

<https://dx.doi.org/10.1177/0018726715618765>

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## **Older British employees' declining attitudes over 20 years and across classes**

*Michael White and Deborah Smeaton*

### **Abstract**

British employers, under increasing competitive pressures, and applying new technology and work organization, have sought to reduce labor costs, resulting in work intensification and precarity. Older employees as a result are exposed to work demands that conflict with expectations of favourable treatment in late career. National survey data for Britain in the years 1992, 2001, 2006 and 2012 demonstrate decline in overall job attitude among older employees following the changed conditions of the 1990s and across the major recession commencing 2008. To assess whether this decline is unequally distributed, a decomposition by socio-economic class is carried out. This shows that older employees in the 'service class' of managerial and professional employees are affected at least as much as older employees in intermediate and less-skilled classes, thus underlining the age effect and showing that 'service-class' employees are not invulnerable to a changing economic environment.

### **Keywords**

class, globalization, job/employee attitudes, older employees, quality of working life

## **1 Introduction**

Older employees in Britain have been stereotyped as loyal and dependable . Employers are thought to value them, and employees themselves are asked to stay working for more years in order to save the welfare state from the crippling costs of longevity (Esping-Anderson, 1996; OECD, 2004). However, things have not been going well for older employees, over the past two decades. They have suffered from a disruption of the smooth, predictable transition to retired status through job loss in late career (Beck, 1992). Some have been driven into the precariat (Standing, 2011). Many others have been stressed out or burnt out by long hours, high work demands and the pressures of continuous organizational change (see later). It is not surprising then that older employees' organizational commitment (OC) has been declining, relative to that of younger employees, since the early 1990s (Felstead, 2010).

The present research starts by replicating and extending the existing findings on the decline in the work attitudes of older employees. Its main contribution, however, is to disaggregate those findings by socio-economic class (henceforth, 'class'). To the question, 'What makes a class analysis worthwhile?', four answers can be given. First, class is a major axis of inequality, and inequality remains one of the chief drivers of social research and of political debate. One especially wants to know whether the life-stage of being an older employee represents yet another locus of disadvantage for less-skilled/low-paid workers – have their 'bad jobs' been turning still worse? Secondly, the across-class distribution of the age effect bears on debates around whether class differences persist in the changing world of 'late' capitalism, or whether class differences are disappearing. This type of debate is complementary to the first, because it particularly focuses on the 'higher' class of managerial and professional employees, questioning

whether they continue to enjoy the distinctively favoured type of employment relationship that has been attributed to them, or whether they have been/are being reduced to a riskier type of employment relationship based simply on market forces. While an age analysis cannot finally resolve this debate, it can provide evidence that is highly relevant. Thirdly, the interpretation of the older worker effect itself changes according to whether the effect depends on class. One can hardly talk about a general age effect if that effect is class-dependent. Fourthly, the practical or policy interpretation of the age effect will depend on whether it is concentrated in a particular class. Disaffected workers in the lower (low-pay, low-skill) class may have 'extended working lives' imposed on them by tax and benefit policies, but such social control will be harder to achieve if disaffection also exists where personal resources are greater. From an employer viewpoint, also, the implications for corporate performance, and for HRM response, differ depending on how the age-related decline in attitudes is distributed across different classes of employee.

The article is framed within several conceptual or theoretical assumptions which we do not argue *ab initio* since they are based in existing literature. We assume that the work situation of individual older employees has altered because of macro-level changes (Hofäcker, 2010) that have affected economies and employers. We assume that both employer policy and employee response follows the 'rational action' model of Goldthorpe (2007). This implies that when employers are under external pressures to reduce costs they address areas of high cost where cuts are easy; where employees are adversely affected as a consequence, they downgrade their side of the exchange relationship with their employer. The employee outcomes on which we focus are organizational commitment (OC) and overall job satisfaction (OJS), the most widely used

attitudinal measures in organizational research. In part these attitudes reflect the utility or value of employment for the individual (Clark et al., 2008), in part they constitute the ‘voice’ of employees in response to their circumstances, and thirdly they are strongly predictive of work performance, OCB, timeliness, attendance, and propensity to quit (Harrison et al., 2006), which makes them important for employers. (For a theoretical basis identifying work attitudes with work motivation, see Latham and Pinder, 2005). We further assume that older employees refer to an implicit ‘psychological contract’ that involves their expectations (Rousseau, 1995): this assumption motivates a contrast of older with younger employees. Finally, for our measure of class, we adopt the schema of Erikson and Goldthorpe (1993: 27-35), and to interpret what class means, we follow Goldthorpe’s (2007) explanation in terms of differently constituted employment relationships offered by employers.

While a class analysis of the age effect is the main new contribution of this article, there are two other ways in which it breaks new ground. The coverage of both organizational commitment (OC) and overall job satisfaction (OJS) – together constituting the ‘overall job attitude’ of Harrison et al. (2006) – has not previously been attempted in any study of older British employees. Further, the 20-year period over which comparisons are made is the longest for this group; and for the first time, the investigation includes the period from before the 2008 financial recession to after it, testing whether older employees’ attitudes became more favourable under conditions when some might consider themselves lucky still to have paid work.

## **2. The changing treatment of older employees, and the role of class**

### *2.1 Older employees under traditional and new dispensations*

British labour historians (e.g. Russell, 1991) have shown that from the early 1800s there were large employers who offered job security, and discretionary privileges such as sick pay, to 'loyal' older employees. Out of this gradually emerged the elaborate systems of workplace benefits, notably occupational pensions, that came to characterize the large-firm and public sectors in Britain. In the USA's primary sector, still more complex systems known as 'internal labour markets' became established in the twentieth century, and these too tended to favour older and long-serving employees (Edwards, 1979).

Why would employers offer such advantages to older employees, when they are both costly and restrictive from the employer viewpoint? Lazear (1981) answers the question with his incentive theory of deferred compensation. Assuming that older employees get pay and benefits that cost in excess of their current productive contribution, employers partly offset the costs by under-rewarding young employees relative to their productivity (with an implied promise of later recompense), and gain outright by saving on the costs of direct supervision and performance monitoring systems. It pays employees to put up with initial under-payment in order to get favourable treatment later on; and it pays them to work conscientiously so that they will still be employed to collect on the deferred benefits. Then too, the sociological theory of the life-course points to further advantage for older employees coming from institutionalization of the retirement transition via State pension systems – in Western economies especially (see Hofäcker, 2010).

However, as noted in our opening paragraph, this favourable dispensation for older employees has been breaking down. In part this can be regarded as just an aspect of the general dislocation

of the post-war 'Golden Age' through technological change, and restructuring of international trade, competition and finances that accelerated during the 1990s. This background set of developments has been referred to variously by labels such as 'globalization' (Beck, 1992; Dreher, 2008), 'informational economy' (Castells, 2000), and 'marketization' (Cappelli, 1999). What these diverse labels and viewpoints share is the perception of rapid and interconnected macro-level changes that permeate contemporary market economies. From the specific viewpoint of older employees, there are two major drivers of change. One is the intensification of cost pressures on employers, while the other is the use of information and communications technology to monitor performance (Green, 2006; McGovern et al., 2007). The costly older employee's job becomes at risk, and in parallel the deferred compensation regime becomes less attractive to employers, thus exposing older employees to the general increase in work pressure or work demands that has been documented by Green (2006). There is substantial evidence that these have been actual rather than potential or theoretical developments. For insecurity and job loss, there is the USA manufacturing study of Koeber and Wright (2001) and the wide-ranging European reviews of Guillemard and Rein (1993) and Hofäcker (2010); recent official statistics show that compulsory redundancy has become the most common reason for job exit among older employees in Britain.<sup>1</sup> Movement of older British employees into marginal or precarious jobs has been reported by Lissenbergh and Smeaton (2003), McNair (2006), Roberts (2006) and Lain (2012). Older employee experience of work pressures has also been widely reported (Johnson, 2004; McNair and Flynn, 2005; Loretto and White, 2006; Smeaton and Vegeris, 2009; Smeaton et al., 2010); while de Jonge (2007) and Hintsä et al. (2015) suggest the importance of an imbalance between effort and reward. Several studies have reported that the experience of work strain, high workload and/or lack of personal control is implicated with intentions of older

employees to retire early (e.g., Lin and Hsieh, 2001; Barnes et al., 2002; Higgs et al., 2003) or with actual early retirement (e.g. Smeaton et al., 2010; Hintsa et al., 2015).

It is possible that decline in the attitudes of older employees is merely part of a wider societal tendency. We argue however that older employees will react *more negatively* to a declining work situation than younger employees over the period in review. This is because they have been socialized into expecting favourable treatment to come in their elder years, and have undergone the less favourable treatment in earlier years on that basis. They therefore experience intensified work pressures and rising insecurity as a breach of an implicit contract, a renegeing on the part of employers. This interpretation is consistent with the theory of psychological contracts (Rousseau, 1995) and specifically in regard to contract breaches and consequent negativity (Robinson, 1996; Coyle-Shapiro and Kessler, 2000). Our argument, then, is that older employees have more negative attitudes/evaluations than younger employees *not* because they are worse affected but because they have lost more of what they expected to get.<sup>2</sup>

A fundamentally different route to predicting an age effect is by reference to what are taken to be distinctive motivations or emotions among older workers, especially those resulting from change in resources or goals with ageing. For instance, the ‘conservation of resources’ (COR) perspective (Wright & Hobfoll, 2004) contends that people seek to build up and maintain coping resources to manage their work and life, while older employees experience these resources being pared away and thus become emotionally fragile. Treadway et al (2005), deploying the COR perspective, argue that older employees tend to cope less well with threats at work. Theories of this type – there are several others<sup>3</sup> - imply that older employees will be reacting somewhat

negatively to all manner of pressures. Thus, one can interpret negative attitudes consequent on the secular rise in work pressure and insecurity as yet another instance of vulnerability due to ageing. But this characterization of older employees' motivational or emotional state is debatable for several reasons. It risks being used in support of the negative stereotyping of older employees that has been extensively refuted by Ng and Feldman's (2012) meta-analysis. It also appears inconsistent with several detailed studies by work psychologists that reveal positive motivation among older employees, and/or considerable complexity in the relations between age, work situation and individual responses. The review by Matthieu and Zajac (1990) found age to be positively related to 'attitudinal' (affective) commitment. Ng and Feldman (2008) reviewing a range of studies report older employees exhibiting positive behaviours such as OCB, safe working, timeliness and good attendance. The meta-analysis of Kooij et al. (2010) finds older employees positively responsive to teamworking and flexible work schedules, that are usually reckoned characteristic of new work organization. Mauno et al. (2013) in a study of job stressors and subjective well-being found that in some circumstances older age *reduced* the negative effect of high workload. See also Kooij et al. (2011) for nuanced evidence of complexities in age-motivation relationships.

While we acknowledge the promise of resource-based motivational theories to explicate the response processes of employees, we feel its most useful application at present is in exploring the micro-to-micro level, in studies such as Mauno et al. (2013), where local variations in response are of most interest. For the economy-wide response of older employees to macrosocial change, we require a theory that points to a common denominator across many different local and personal circumstances. Older employees' responses to external pressures

and challenges may vary in a great many ways according to context and individual (including motivational) differences, but a common element across most individuals will be a rational appraisal of their situation relative to expectations (Goldthorpe 2007 (1): 139-62).

Finally there is a considerable body of research that focuses not on whether, why or how older employees have come to be problematical in some way, but rather on what policies and practices on the part of employers will ameliorate their situation and/or performance. These include reviews and studies of HRM practices in relation to age (see Kooij et al., 2010; 2011; 2014). While we do not gainsay the interest of this approach, it generally does not address the issues set out in our introduction since it lacks both an historical perspective and a macro-to-micro framework. Partial exceptions are Hennekam and Herrbach (2013) and Hintsä et al. (2015), both of whom acknowledge the adverse effects of high workload and work stressors on which we also lay emphasis.

## *2.2 Class concepts in relation to older employees*

The point of the present article is *not* to talk of ‘the older employee’ in an altogether general way, but to consider whether different classes of employee are differentially exposed to change and risk. To simplify discussion and analysis of class, we adopt the three-class condensed schema of Erikson and Goldthorpe (1993: 35-47)(henceforth, EG). Setting aside non-employees (proprietors, self-employed, unemployed, etc.), the schema consists of an ‘upper’ grouping of managers and professionals (often referred to as the ‘service class’), a ‘lower’ grouping of employees doing semi-routine and routine work – for the most part low-paid, and an ‘intermediate’ grouping that includes those in administrative, supervisory, and technician

(including some skilled manual) jobs that are below managerial or professional level. British official statistics use the NS-SEC (National Statistics Socio-Economic Class) system that is consistent with EG theory and can be collapsed to the 3-class form.

It is possible to see these classes as merely a convenient grouping of occupations, but this is to ignore the theory that underlies the grouping, as expounded by Goldthorpe (2007 (2): 101-24). Occupations are conceived to vary along two main axes, skill-asset specificity (degree of specialized or firm-specific knowledge) and difficulty/ease of monitoring. McGovern et al. (2007: 70-80) test this concept and conclude that it is supported in British data. Higher skill level generally implies greater cognitive complexity, and this affects the employer's choice of an effective means of control and monitoring. Beyond this obvious point we need not discuss the skill dimension further for present purposes (see however Tählin, 2007). Our focus is rather on the ease/difficulty of monitoring.

Goldthorpe (2007) argued that for the 'lower' class, with its relatively simple and replaceable skills and easily measured outputs, the employment relationship is tenuous and monitoring is exercised by direct supervision and/or output-based incentives, without any long-term commitment to job security. The 'upper' class of managers and professionals, on the other hand, has complex skills and knowledge that is crucial to the employer's interests, and incentives are supplied through salaries, promotions, service increments and pensions, all of which construct a long-term employment relationship. Finally, the intermediate class is managed in a way that is partially like the service class but can also have elements of more direct control, as illustrated in call-centres.

The chief technical change of the 1990s that affected monitoring/control was the spread of information and communications technology (ICT) and associated changes in work organization. The varied ways in which this set of changes affected, or was capable of affecting, work intensity have been analysed by Green (2006: 68-93) and McGovern et al. (2007: 169-71). Another relevant change during the 1990s took place in the distribution of incentive payment systems across classes. McGovern et al. (2007: 167-8) report that the greatest increases in the use of incentive pay during the 1990s were at managerial and professional level – by 2000 three in four of senior managers and professionals were getting some form of incentive payment. One should also note the continuing widespread use of workforce reductions and redundancy programmes through economically favourable conditions as well as in periods of economic contraction (Turnbull and Wass, 2000) and in the public sector as well as the market sector. Insecurity is part of the ‘incentive’ mechanism.

What then are the implications of these major changes *specifically for older employees* in each class? At the intermediate and lower skill-levels, these appear straightforward. The increased use of ICT monitoring appears to have been a major influence on work intensification and work strain in these groups (McGovern et al., 2007). Employees at these levels have also felt threatened by the wide use of labour-shedding, and this constrains them to accept rising work demands (Burchell et al., 2002). Older employees in these class-groups will thereby be exposed to closer control and to rising insecurity if they are unable to achieve sufficient productivity to match their relatively high employment cost.

Predictions become more debatable in regard to the managerial and professional employees – EG's service class. The pay, pensions and perquisites they get make older employees in this group a prime target for employers to seek cost reductions and effort increases. Some theorists have argued more generally that occupational class differences in treatment are being washed away as employers rely more on the external market to establish pay and conditions, and as managers and professionals themselves become more mobile (Cappelli, 1999); the limit position of this argument is that the class concept becomes redundant because employers are relying wholly on a market for skills and knowledge (Sørensen, 2000). If that is the case, then one would expect to find older managers and professionals losing their privileged position and affected just like in other occupations by more pressure and tighter monitoring, while no longer able to extract class 'rents' (Sørensen, 2000) through deferred compensation and benefits.<sup>4</sup> The increased use of financial incentives for managers and professionals, noted above, surely indicates a greater emphasis on short-term performance, while the study of Worrall and Cooper (2001) showed managers in particular under considerable strain from continuous organizational change. This view has been countered however by arguments that employers have limited scope for changing the established treatment of the service class. In such arguments it is pointed out that the salaried employment relationship offered to the service class (making heavy use of deferred rewards, e.g. via increments, promotions and pensions) is the one that most reliably ensures the availability of expertise that is crucial for employers. So it is argued that the preferential treatment of managers and professionals is unlikely to be disturbed by the return of commodified employment relations that are affecting other ranks of employees (Breen, 1997). Again, if managers and professionals know better than their employers how to achieve organizational progress and innovation, then any move toward tightly specified incentives for

them is likely to have detrimental effects on the organization such as through a distorting focus on short-term objectives (Goldthorpe, 2007 (2): 113-14) . Indeed, the recent disasters in the British financial sector have been popularly attributed to just such perverse incentives. To lend empirical support to this perhaps somewhat abstract argument, one can point out that many of Britain's large employers drew back at the end of the 1990s from the 'delaying' movement, in which middle management was being stripped away, in order to restore career paths for this group (see, e.g., CIPD, 2003). On the basis of these arguments, then, one would expect older managers and professionals to be largely excluded from a contraction of deferred reward or from intensified work demands. Then one would also expect the main impact of older-employee cost reductions to fall still more heavily on other occupational classes below the managerial/professional level, where work pressures and performance demands can with less risk to the employer be ramped up by means such as those described by Green (2006).

### **3. Hypotheses**

The withdrawal or contraction of favourable treatment for older employees is presumed to have negative implications for their overall work attitudes. Because the expectations built up in early career were for a more favourable treatment after long service, older employees are hypothesized to be more affected by a sense of 'contract violation' than younger employees. Using OC and OJS ('overall job attitudes': Harrison et al., 2006) as outcome variables, we propose the following fundamental hypothesis:

H1: Overall job attitudes of older employees, relative to younger employees, move in a negative direction over the 1992-2012 period.

With regard to class differences in the age effect, we steer a middle course between the polar positions. We are inclined to doubt whether managers and professionals ever had a position of power with respect to their employers, such that they could extract rents in the sense of Sørensen (2000). The special nature of the skills of managers and professionals is appraised by Breen (1997) and Goldthorpe (2007 (2)) as giving them a rationally-based *market* power leading to high levels of reward. The question at issue is whether employers have the *technical means* to leverage more effort in return for these high rewards. In our judgement, such means are in fact provided by the development in the recent decades of personal appraisal systems and of quantified performance incentives. Employers are certainly taking advantage of these techniques. Furthermore, the threat of dismissal in case of inadequate performance has always been required by incentive interpretations of deferred compensation (Lazear, 1981) and this threat is more potent when deferred rewards are high, as in the case of managers and professionals, and when redundancy has become a standard instrument of corporate employment practice. In short, we judge that there is scope for tightening the effort-reward bargain while still leaving enough difference to keep managerial and professional occupations distinctive and attractive. We therefore formulate a second hypothesis as follows:

H2: Overall job attitudes of older employees within each class, *including* the service class (managers and professionals), become more negative relative to younger employees *within that class* over the 1992-2012 period.

We make no prediction as to whether the age effect within the service class is greater or less than the age effect within another class, nor whether there are different age effects between the intermediate and lower classes, since there is reason to predict negative reactions among older employees in each class. Our investigation in this last respect is exploratory.

## **4 Data and variables**

### **4.1 Data**

The research uses four cross-sectional survey datasets representative of British employees at different times and different stages in the business cycle: for 1992, the ‘Employment in Britain’ survey; for 2001 and 2006 the ‘Skills Surveys’ of those years (SK01 and SK06: Felstead, 2010); and for 2012 the Skills and Employment Survey (SES2012). Age limits of 20-60 have been applied throughout. The surveys given these age limits provide samples of 3458 employees in 1992 (71 per cent response rate), 4005 in 2001 (63 per cent response rate), 4237 in 2006 (57 per cent response), and 2377 in 2012 (49 per cent response). The decline in response rates over these years has been general to social surveys in Britain. Booster samples for certain geographical areas were obtained in the 2006 and 2012 surveys but these boosters are excluded from the present analysis so as to maintain uniform spatial representation across the surveys. All four surveys had a similar sampling design, and information was in all cases collected from respondents by means of personal interviews in the home. Sampling weights are provided with the source datasets, which are available with documentation in the UK Data Archive.

### **4.2 Dependent variables**

The analysis uses measures of (1) overall job satisfaction (OJS), and (2) affective organizational commitment (OC). OJS is obtained by the familiar single-item measure, here with a seven-point

response scale. Affective OC measures the degree to which an employee identifies with the goals and values of an organization and is willing to exert effort to help it succeed (Kalleberg and Berg, 1987). It is here measured as the sum of six agreement items that were first used by Lincoln and Kalleberg (1990). The items have a reliability (Cronbach alpha) in these surveys of 0.79. Estimated effects for the OC and OJS measures can be interpreted directly as proportions of a unit of response. Item wording and descriptives are shown in Table 1.

[Table 1 about here]

### **4.3 Explanatory variables**

The chief explanatory variables are time period, age group, and class. Year 1992 represents the third year of a severe economic downturn in Britain, which began with a 1990 recession and ended after 1993. The 1990s as a whole are the watershed when ICT, with associated organizational change, became widely established and where globalized competition and finances ramped steeply up (Dreher et al., 2008). Year 2012 represents the fifth year of the economic downturn that began with a financial sector crisis in 2008. Both 1992 and 2012 come two years before the start of economic upturns. Year 2001 came at a high point for the British economy, following six years of steady growth and peak profitability. By year 2006 the economy still appeared to be stable and growing, although private sector profitability had fallen somewhat and employment growth was largely maintained by public sector expansion.

Age 50 is the most usual cut-off for defining older workers (Felstead, 2010), and in Britain this appears consistent with managerial perceptions (Loretto and White, 2006). Age 50 has also until recently been the usual cut-off when pensionable early retirement is permitted (if at all) in

occupational pension schemes.<sup>5</sup> Comparisons are made with younger and prime-age employees in the 20-49 age bracket. Excluding people aged over 60 reduces the problem of sample selection, because beyond 60 is when early retirement or incapacity (disability or chronic illness) is particularly common.

The measure of class is derived from the NSSEC (National Statistics Socio-Economic Classification) scale that is closely modelled on the EG schema. There are 30 occupational categories, of which 4 are excluded here as they apply only to self-employed people. The remaining 26 categories are then collapsed into six that correspond to the broad class categories presented in Erikson and Goldthorpe (1993: 35-47). These are: higher managerial and professional; lower, or associate, managerial and professional; administrative; lower supervisory and technical; semi-routine occupations; and routine occupations. To maintain sample adequacy when interacted with age-group, classes are further condensed into three: the higher or service class (managerial/professional occupations); the intermediate class (administrative, supervisory, and technical occupations); and the lower class (semi-routine and routine occupations); such a grouping is also used by Erikson and Goldthorpe (1993).

The strength of an analysis specification depends on what variables are judiciously excluded as well as on what variables are present. We do not introduce perceived workplace practices into the set of explanatory variables, even though a number of relevant variables are present in the source data. Kooij et al. (2010) review studies that have related workplace practices, as reported by employees, to the attitudes of older employees. There are also a great many studies that use workplace practices reported by employees (especially HRM practices) as regressors without

any particular orientation toward older employees (e.g., Gong et al., 2009; Nishii et al., 2008; Takeuchi et al., 2007; 2009). Our view is that this method is open to common method artefact (Podsakoff et al., 2003) and to omitted variable bias, and should accordingly be avoided. For instance, employees who are more satisfied are also more likely to say that various HRM practices are present in their workplace, especially if as often the case the questioning about the practices is value-laden (this difficulty is noted in Kooij et al., 2010). Furthermore, unless the set of practices is sufficiently extensive, and appropriately summarized, there is a risk that *unobserved* practices will be correlated with those present in the analysis, thus violating a fundamental assumption of the regression model (for further discussion Wright et al., 2005; White and Bryson, 2013).

#### **4.4 Control variables**

Control variables address compositional changes over time that potentially vary between age-groups and could affect attitudes. As older people have lower participation rates than younger, it is important to control for the variables that are commonly assumed to affect the employment participation decision. These comprise gender; highest educational qualification (age and class are already present as explanatory variables); and family situation, with questions about whether the respondent had a partner, and whether any under-16 dependent child was present. These family questions were interacted with gender because of their different importance for labour market participation between women and men. A second group of control variables concerned the type of organization in which the individual worked, with a five-category variable for workplace size, ranging from 10 or less, to 500 or over, dummies for private sector and for

presence of a trade union, and a classification of industries into six broad groups (primary; manufacturing; construction; consumer services; finance and business services; public services).

Numerous studies in the literature on older employees include a tenure variable in their analysis specification (Kooij et al., 2010 reports on studies that examine the relationship between age and OC or OJS while controlling for tenure; Bal et al., 2013 argue that age effects change with tenure). Unfortunately, tenure is hard to measure without error (because of problems of memory); this ‘errors in variables’ problem can however be ‘fixed’ by dichotomization at the median (Wald, 1940). More problematically, in models of overall job attitude, tenure is prone to reverse causation (because attitudes influence the probability of job separation) and this may inflate estimates of the tenure effect and distort the overall covariance structure. This is a problem for which there is no easy ‘fix’.<sup>6</sup> Accordingly we do not include tenure in our preferred specification. However, we run variant analyses that do include tenure (in the dichotomized above-median v below-median form) as a test of the robustness of our specification.

## **5 Analysis**

The analysis method is robust regression, with OC and OJS analysed in turn. Robust regression is an OLS-like methodology which takes account of weighting and complex survey design in calculating standard errors (Berk, 1990). The dependent variables are treated as having cardinal (interval) measurement scales.

The analysis is in three stages. In the first stage, confined to the OC and OJS outcomes, the focus is on the effect of being an older employee, relative to being a younger/prime age

employee, averaged across class-groups (thus testing H1). In the second stage, the relative effect of being an older employee is interacted with class-group, so that age effects can be separately obtained for older employees within each class (thus testing H2 and providing other information of an exploratory type). The third stage is to test the robustness of results to inclusion of a tenure variable.

The methods involved in obtaining these estimates can be further specified as follows. For the first analysis stage (H1), in each survey the partial effect of age is estimated by the coefficient on the 50-plus dummy, which is equivalent to the conditional mean difference in attitude between the two age-groups. These coefficients can then be compared between any two survey time-points. (Multiple-time comparisons are avoided since these may inflate test statistics: see Bertrand et al., 2004). We are most interested in two over-time comparisons, 2012 against 1992 (the 20-year change in attitudes, comparing similar points in the business cycle) and 2012 against 2006 (the pre-recession to post-recession change in attitudes). Year 2001 plays a supporting role in developing the interpretation. Comparing age effects across years is analogous to the ‘difference in differences’ estimate that has been widely used in evaluation research (see Wooldridge, 2002: 130-2). An advantage offered by the design is that it removes unobserved differences between the age groups to the extent that these are constant over time. The design thus helps reduce the potential problem of persistent unobserved influences, such as positivity/negativity of outlook, which may vary with age, on attitudinal expressions (see Ferreri-Carbonell and Frijters, 2004). On the assumption that such age-specific unobserved differences continue across time periods, the design differences them out.

In the second stage of analysis (H2), the above specification is enlarged by inclusion of an interaction term between the age-group dummy and the 3-level class-group measure, while analysis continues to be carried out separately for each year. Model estimates for interactions do not directly yield the effects of interest, since each variable in the interaction depends partly on the other variable for its effect (see Wooldridge, 2002: 15-18). To clarify the results, therefore, the model estimates are used to compute the predicted mean marginal (or partial) effects of age-class combinations within year.<sup>7</sup> These predicted mean marginal effects can then be compared (differenced) in a variety of ways. Most simply, we can consider how the effect of age (50-plus v. under-50) changes across years within a particular class group, say the upper/service class. We refer to these as the within-class effects. This provides a double-difference estimate of the same type as that obtained in the first stage analysis, but filtered on class. One may also go further and compare such double-difference estimates across a pair of occupational class groups, say upper versus lower. This yields a triple-difference estimate, permitting tests of differences between class-groups in the age-group differences over time.

## **6 Results**

In the following, the shorthand expression ‘age effect’ and similar phrases stand for the estimated effect of the older (50-plus) group relative to the younger (under 50) group, in a given year. Differences between years, within classes and between classes always refer implicitly to a comparison of age effects.

### **6.1 The relative overall attitude of older employees over time**

Table 2 presents the age effects on OC and OJS for each of the four years. All analyses include the full set of controls, but for reasons of space, only the estimates for the age effects are shown

(full results are available on the authors' institutional web-site). Panel (a) summarizes the results for OC and panel (b) for OJS. In the initial year, 1992, both age effects were significantly *positive*, as was to be expected on the basis of pre-1990s research. The estimated age effects on each attitude then falls progressively across the subsequent survey-years; by 2012 the age effect for OC is significantly negative, and while that for OJS remains positive it is not significantly different from zero. Differences between years are shown at the right-hand columns of Table 2. Considering the difference (2012 v. 1992), the change in the age effect for OC is -1.72, with an associated t-statistic (absolute value) of 5.66; the corresponding figures for OJS are -0.208 and 1.97. The across-recession fall (2012 relative to 2006) is also significant for OC (-0.4981,  $t=1.99$ ) but not for OJS. The picture of over-time decline for OJS is gentle but steady; differences from 1992 are not significant in 2001 and 2006, nor is the 2012 v. 2006 difference significant.

[Table 2 about here]

Overall, these results provide strong evidence of declining overall attitude among older employees, consistent with H1. There is no indication that this tendency weakens over time. Experience of the severe recession starting in 2008 did not lift older employees' attitudes with feelings of relative good luck to be in a job, rather there was a further significant fall between 2006 and 2012 in the case of OC, and a continuing gentle decline in the case of OJS.

## **6.2 Older employees' overall attitude within occupational class groups**

Having confirmed the general picture regarding older employees' overall job attitude, we now examine the role of class. Table 3 provides the relevant results for OC. As explained in section 5, we present these results in terms of marginal mean predictions, and these are shown separately for each age-group within each class-group, so as to give a more complete picture. The age-

group within class effects are the differences between the age-specific marginal mean predictions, and these differences are the basis for over-time comparisons that are shown in the right-hand columns of the table.

The main points to be drawn from Table 3 are as follows. (1) By 2001 age effects of OC within each class have declined from their initially positive level and are not statistically distinguishable from zero. (2) Over the 20-year period 1992 to 2012, the age effect on OC declines significantly both within the higher or service class and within the lower class. There is also a decrease in OC within the intermediate class but it is not statistically significant. (3) The 20-year difference within the higher class is not significantly greater than that within the lower class ( $t=1.55$ ). (4) The difference in OC between 2006 and 2012 is significant at the 10 per cent level<sup>8</sup> within the higher class-group ( $t=1.72$ ).

Membership of the higher/service class evidently did not insulate older employees from declining OC. This is consistent with H2. But close inspection of Table 3 shows that the within-service-class age effect resulted as much from an absolute increase in OC among younger and prime-aged managers and professionals as from an absolute decline in OC among older managers and professionals. Moreover, even in 2012 the absolute levels of mean predicted OC in the higher class-group are as high as or higher than the absolute levels in the intermediate and lower class-groups, whether one considers the older or the younger age category.

[Table 3 about here]

In a similar way Table 4 presents results for the OJS measure. As was the case with OC, the age effect on OJS was positive in 1992 irrespective of class. In 2001 this remained the case within the intermediate and lower classes but not in the service class, where the effect became non-significant. Moreover, within the service class the age effect for OJS fell significantly between 1992 and 2001 (by -0.33,  $t=2.19$ ), and this fall was significantly greater than within the intermediate class (the between-class difference has  $t=2.05$ ) and within the lower class-group ( $t=2.25$ ). In 2006 and 2012 the age effects had become non-significant within each class-group, but the service class was still moving in a negative direction relative to the lower (significant at the 5 per cent level in 2006). Over the 20-year period the age effect for OJS fell significantly in the higher class (by -0.37,  $t=2.36$ ), but the difference across the 2008 recession was non-significant. The 20-year differences within the other two classes were small and not statistically significant. Overall, the evidence is not sufficiently systematic for us to be confident that differences in OJS *between* the class-groups existed over the 20-year perspective. However there is reasonably strong evidence here that the OJS of older employees relative to younger was declining *within the service class*, consistent with H2.

[Table 4 about here]

### **6.3 The robustness of overall attitude analyses to inclusion of a tenure variable**

Section 4 explained why tenure was not included in our preferred specification for analysis of overall attitudes. Table 5 compares the estimated age-class effects on overall attitudes for models that include/exclude the tenure variable. For simplicity of presentation we use age effects separately estimated for each class, rather than the marginal effects from age x class

interaction models as in Tables 3 and 4. The estimates when tenure is excluded are very similar to those previously presented.

[Table 5 about here]

The inclusion of a tenure variable makes very little difference to the estimated age-class effects. Moreover, from a comparison of the model F-ratio statistics it can be seen that including tenure makes little difference to model fit.<sup>9</sup> We conclude that the main specification is robust to inclusion/exclusion of the tenure variable. Estimates for the tenure variable itself are included in Table 5 but should be regarded with caution for the reasons given in section 4.

## **7 Conclusions and discussion**

The chief findings concerning H1, which we set up to frame analysis of overall job attitude among older employees as a whole, are as follows. The age effect is significantly negative for OC for both the 2012 v 1992 comparison and for the 2012 v 2006 comparison; for OJS, it is significantly negative for the 2012 v 1992 comparison. Thus the analyses provide strong evidence in support of H1. There is an age effect of declining overall attitudes that spans the whole 20-year period.

Disaggregating by class-group (H2), the age effect is negatively signed for five of the six 2012 v 1992 and 2012 v 2006 comparisons and positively signed only for the intermediate class on OJS over the 2012 v 2006 period. For the service class the age effect is significantly negative for both OC and OJS in the 20-year comparison, and for the 2012 v 2006 comparison it remains significant for OC on a 10 per cent criterion.<sup>10</sup> The age effect is also significant for the lower

occupational class-group on the OC measure over the 2012 v. 1992 comparison, though not for the 2012 v 2006 comparison. The age effects however are non-significant for the intermediate class-group.

There are several points of significant difference between the service class and either the intermediate class or the lower class, and these always show the age effect more negative in the service class. However, these differences are not found uniformly, and some comparisons are statistically inconclusive, so one cannot assert that the service class has a more negative age effect overall. A plausible hypothesis for future research is that the service class is heading downward relative to the other classes in terms of overall job attitude among older members, but it will need further data to test this. Again, the absence of significantly negative age effects for the intermediate class should not be taken to show that older employees in this class have fared 'better'; mostly the estimates for this class do not differ significantly from those of the other classes.

Case study and qualitative research can provide more concrete interpretations of the average tendencies suggested in our quantitative study. Here we can only offer a few indications. Older professional and managerial workers have been found to place decreasing priority on extrinsic job characteristics such as pay, promotion and status, attributing greater value instead to intrinsic characteristics such as: autonomy, work-life balance, good workplace relationships and job security (Sturges, 1999; Smola and Sutton, 2002; Kanfer & Ackerman, 2004; Bown-Wilson and Parry, 2013). These late career preferences are in direct conflict with employment practices that intensify the work experience (undermining work-life balance), and threaten security. Such

developments represent a still greater change when related to the expectations of this previously privileged class.

The introduction stated four purposes of a class analysis of older employees' attitudes, and these can now be used to frame a brief discussion of findings. The research indicates, firstly, that the age effect is *not* distributed in such a way as to increase *inequality* to any marked degree. Admittedly, older employees in the class of routine and semi-routine employees, usually regarded as the most disadvantaged, have had deteriorating attitudes, suggestive of further negative experience of employment. But this is also true of older employees in the service class that is generally regarded as the most privileged. On the other hand, it can be argued that this is of little consolation to the less skilled workers who have long suffered the indignity of insecure, tightly controlled and closely monitored working conditions. The fact that their OC has continued to fall, even from initially low levels, at least confirms and underlines the relative disadvantages associated with low skill and low paid work. Roberts (2006) provides an extended case study of how a deteriorating work situation impacts on older manual workers and there are varied insights into the precarity and stress experienced by this group in the literature cited in section 2.1.

The second and complementary implication to be drawn concerns the employment relationship of the service class. The findings tell against those who have argued that this class is invulnerable to the pressures of a 'globalized' or 'marketized' economic order. Older managers and professionals have it seems been disappointed at least as much as other classes of employees. On the other hand, the evidence of Tables 3 and 4 does not suggest that the service class *as a*

*whole* has lost its distinctive and advantageous position vis-à-vis other classes. The findings suggest, rather, that there has been some reallocation of advantage between younger and older members of the service class – with the most expensive (i.e., the older) losing relative to the less expensive (younger).

The same evidence also strengthens the *interpretation of the age effect* on attitudes. The age effect has wide generality, and is not dependent on the experience of a particular class. The main gap in this respect is the lack of conclusive findings concerning the intermediate class. On the overall evidence, one can reasonably go on talking about a general age effect, but one should avoid any strong assertion that the age effect is uniform until this gap has been filled by further case research on intermediate occupations. At present there is a dearth of qualitative research outside of call-centres. There are however scattered clues in that literature about possible positive consequences in terms of increased promotion chances (Belt, 2002) and opportunities for exercising personal skills (Yeuk-Mui, 2001); these exceptions to the general run of the literature suggest we do not yet have a rounded picture.

Fourthly, the findings, despite limitations that we have noted, are sufficiently strong to have implications for the public policy and the policies of employers. The process of cost reduction undermines attitudes and motivation among older employees and (from the findings of Harrison et al., 2006) this is likely to lead to reduced performance and higher rates of voluntary quitting. This may be efficient from an employer perspective, in that a thinning-out of older employees, keeping the most productive, has been an acknowledged element in the theory of optimal compensation (Lazear, 1981). But it is possibly not efficient from the perspective of public

policy that seeks high levels of participation and ‘extended working life’, and is also currently concerned over productivity (see Phillipson, 2013 for policy discussion of these tensions). As employers become better informed about the declining attitudes portrayed here, they may focus particularly on the implications of declining motivation among the managerial-professional group, because of this group’s large impact on added value. It is in relation to them that innovative HRM policies for older employees are most likely to emerge. Alternatively, employers may simply assume that any problem of motivational decline with age will diminish in future cohorts.

## Notes

1. ‘Insecurity’ includes actual and threatened job loss, whereas in Britain ‘precarity’ has generally referred to temporary, casual and freelance employment contracts. Typically, employees aged 50-64 account for 1 in 4 of all redundancies and at its 2008/9 peak the redundancy rate for this group reached 1 in 10: source, Office of National Statistics, quarterly summaries (series RED02: Redundancies by industry, age, sex and re-employment rates); own calculations.
2. We interpret the psychological contract in terms of expectations: this was the original formulation, but recently a concept of obligation has been introduced that we find unhelpful. See Coyle-Shapiro and Kessler (2000) for overview.
3. A theory in some respects similar to COR is Person-Environment-Fit (PEF) (French, Caplan & Van Harrison, 1982), in which job stress is presented as a relationship between the person and the environment that is appraised by the person as exceeding resources and risking wellbeing. Resources are also a central focus in the human development lifespan theory of selection, optimisation and compensation (Baltes *et al.*, 1999).
4. Sørensen (2000) regarded the deferred rewards provided for older employees as efficient incentives and excluded them from the service class’s ‘rents’.
5. In 2010 the British government required pension schemes to raise the eligibility threshold for early retirement to 55.
6. The textbook solution is to instrument tenure and perform a two-stage least squares analysis. Valid instrumental variables however tend to be elusive.

7. The mean marginal effect is the difference in predicted means under the model as the age-group variable within class-group goes from 0 (under-50) to 1 (50-plus), while all other variables in the model are left at their observed values.
8. The t-statistics can be interpreted as one-tailed when the sign of the estimated effect agrees with hypothesis, thus making 10 per cent significance equivalent to 5 per cent significance in the two-tailed case.
9. The more rigorous likelihood-ratio test is not available here since it is invalidated by complex survey design.
10. See note 9.

**Acknowledgements.** Datasets for this study were provided by the UK Data Service; Alan Felstead gave advice on use of the Skills Surveys. The Editor and three anonymous referees made very helpful comments on earlier drafts of this article. Deborah Smeaton's work was supported by the Lifelong Health and Wellbeing Cross-Council Programme (LLHW). The LLHW Funding Partners for this award are the Economic and Social Research Council and the Medical Research Council [grant number ES/L002884/1]. The usual disclaimers apply.

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**Table 1 Questions and descriptive statistics for overall job satisfaction (OJS), and organizational commitment (OC)**

|   | Mean<br>(s.d.) 1992 | Mean<br>(s.d.) 2001 | Mean<br>(s.d.) 2006 | Mean<br>(s.d.) 2012 |
|---|---------------------|---------------------|---------------------|---------------------|
| OJS + 1992 'All in all, how satisfied would you say you are with your job?' 2001/06/12 'All in all, how satisfied are you with your job?' | 5.407<br>(1.160)    | 5.165<br>(1.238)    | 5.397<br>(1.178)    | 5.326<br>(1.248)    |
| OC (Summative score of six items)   | 15.815<br>(3.201)   | 16.071<br>(3.204)   | 15.902<br>(3.142)   | 16.379<br>(3.973)   |
| <b>Wording of OC scale items ('how much do you agree or disagree?')*</b>  |                     |                     |                     |                     |
| <b>I find that my values and the organization's values are quite similar</b>  |                     |                     |                     |                     |
| <b>I feel very little loyalty to this organization</b>  |                     |                     |                     |                     |
| <b>I am proud to be working for this organization</b>   |                     |                     |                     |                     |
| <b>I am willing to work harder than I have to in order to help this organization succeed</b>  |                     |                     |                     |                     |
| <b>I would take almost any job to keep working for this organization</b>  |                     |                     |                     |                     |
| <b>I would turn down another job with more pay in order to stay with this organization</b>  |                     |                     |                     |                     |

Notes :Statistics are unweighted.

+ Responses 'completely satisfied, very satisfied, fairly satisfied, neither satisfied nor dissatisfied, fairly dissatisfied, very dissatisfied, completely dissatisfied' with scoring 1-7. For analysis the scoring has been reversed so that completely satisfied = 7.

\* Responses 'Strongly agree, agree, disagree, strongly disagree' with scoring 1-4. The scoring has been reversed so that strongly agree=4, except in the case of the second item that already has this sense. An answer 'Don't know' is treated as missing data.

**Table 2 Estimated effects on overall attitudes (OC and OJS) of older employee (50+) with reference to younger (under-50) employees, and over-time differences**

| survey year>    | 1992     | 2001    | 2006    | 2012        | 2012-1992 | 2012-2006 |
|-----------------|----------|---------|---------|-------------|-----------|-----------|
| <b>(a) OC</b>   | effects  |         |         | differences |           |           |
| <b>estimate</b> | 1.2438** | 0.1756  | 0.0234  | -0.4747*    | -1.719**  | -0.4981*  |
| <b>s.e.</b>     | 0.2243   | 0.1521  | 0.1448  | 0.2045      | 0.3035    | 0.2506    |
| <b>N</b>        | 2659     | 3632    | 3703    | 1864        |           |           |
| <b>(b) OJS</b>  |          |         |         |             |           |           |
| <b>estimate</b> | 0.2524** | 0.1155* | 0.1058* | 0.0440      | -0.2084*  | -0.0618   |
| <b>s.e.</b>     | 0.0735   | 0.0588  | 0.0520  | 0.0761      | 0.1058    | 0.0922    |
| <b>N</b>        | 2994     | 3843    | 3891    | 2011        |           |           |

Note: All estimates come from models with complete controls (see text). Standard errors are derived by robust regression.

\* significant at the 5 % level \*\* significant at the 1% level.

**Table 3 Mean marginal predictions of OC, with differences, for older and younger employees within class-group**

|  | 1992         | 2001         | 2006          | 2012         | 2012-1992     | 2012-2006    |
|--|--------------|--------------|---------------|--------------|---------------|--------------|
| mean marginal predictions for age group [ & N], with differences below ( & s.e. of difference) |              |              |               |              |               |              |
| <b>(1)Higher class &amp; 50+</b>   | 17.87 [116]  | 16.88 [344]  | 16.33 [360]   | 16.39 [227]  | -1.48         | 0.06         |
| <b>(2)Higher class &amp; &lt;50</b>  | 15.93 [792]  | 16.67 [1285] | 16.37[1173]   | 17.03 [626]  | 1.10          | 0.66         |
| <b>(1)-(2)</b>   | 1.94 (.37)** | 0.22(0.21)   | -0.04(0.21)   | -0.63(0.28)  | -2.58(0.47)** | -0.60(0.35)+ |
| <b>(3)Inter class &amp; 50+</b>  | 16.68 [121]  | 16.07 [218]  | 15.74 [207]   | 16.24 [139]  | -0.44         | 0.50         |
| <b>(4)Inter class &amp; &lt;50</b>   | 15.97 [658]  | 15.82 [794]  | 15.75 [715]   | 16.33 [363]  | 0.36          | 0.58         |
| <b>(3)-(4)</b>   | 0.71(0.34)*  | 0.25 (0.27)  | -0.02 (0.251) | -0.09(0.397) | -0.80(0.52)   | -0.08(0.47)  |
| <b>(5)Lower class &amp; 50+</b>  | 16.34 [161]  | 15.31 [250]  | 15.37 [332]   | 15.27 [130]  | -1.07         | -0.10        |
| <b>(6)Lower class &amp; &lt;50</b>   | 15.32 [771]  | 15.29 [741]  | 15.26 [916]   | 15.77 [379]  | 0.45          | 0.51         |
| <b>(5)-(6)</b>   | 1.02(0.35)** | 0.02(0.28)   | 0.12 (0.25)   | -0.51(0.36)  | -1.52(0.50)** | -0.61(0.43)  |

Note: All estimates come from models with complete controls (see text). Standard errors (in brackets) are derived by robust regression.

+ significant at the 10 % level; \* significant at the 5 % level; \*\* significant at the 1 per cent level.

**Table 4 Mean marginal predictions of OJS, with differences, for older and younger employees within class-group**

|  | 1992         | 2001         | 2006         | 2012         | 2012-1992     | 2012-2006    |
|--|--------------|--------------|--------------|--------------|---------------|--------------|
| mean marginal predictions for age group [ & N], with differences below ( & s.e. of difference) |              |              |              |              |               |              |
| <b>(1)Higher class &amp; 50+</b>   | 5.76 [128]   | 5.27 [362]   | 5.45 [369]   | 5.31 [236]   | -0.45         | -0.14        |
| <b>(2)Higher class &amp; &lt;50</b>  | 5.49 [868]   | 5.33 [1357]  | 5.46 [1220]  | 5.41[669]    | -0.08         | -0.05        |
| <b>(1)-(2)</b>   | 0.27(0.114)* | -0.06(0.099) | -0.02(0.075) | -0.09(0.108) | -0.37(0.157)* | -0.09(0.131) |
| <b>(3)Inter class &amp; 50+</b>  | 5.64 [130]   | 5.33 [228]   | 5.45 [217]   | 5.29 [150]   | -0.35         | -0.16        |
| <b>(4)Inter class &amp; &lt;50</b>   | 5.37 [799]   | 5.09 [832]   | 5.33 [747]   | 5.13 [441]   | -0.24         | -0.20        |
| <b>(3)-(4)</b>   | 0.27(0.133)* | 0.23(0.101)* | 0.12(0.088)  | 0.16(0.131)  | -0.11(0.187)  | 0.04(0.158)  |
| <b>(5)Lower class &amp;50+</b>   | 5.51 [189]   | 5.17 [271]   | 5.39 [361]   | 5.22 [146]   | -0.29         | -0.17        |
| <b>(6)Lower class &amp; &lt;50</b>   | 5.26 [880]   | 4.90 [793]   | 5.16 [977]   | 5.01 [399]   | -0.25         | -0.15        |
| <b>(5)-(6)</b>   | 0.25(0.106)* | 0.27(0.108)* | 0.23(0.085)* | 0.20(0.135)  | -0.04(0.172)  | -0.02(0.160) |

Note: All estimates come from models with complete controls (see text). Standard errors (in brackets) are derived by robust regression.

+ significant at the 10 % level; \* significant at the 5 % level; \*\* significant at the 1 per cent level.

**Table 5. Age effects by class within year for models with(1) and without (2) tenure variable**

| class ->                   | managers and professionals |              | intermediate |              | semi-routine and routine |              |
|----------------------------|----------------------------|--------------|--------------|--------------|--------------------------|--------------|
|                            | OC                         | OJS          | OC           | OJS          | OC                       | OJS          |
| <b>1992(1) b, s.e.</b>     | 1.77,0.391**               | 0.25,0.123*  | 0.73,0.372+  | 0.18,0.137   | 0.85,0.382*              | 0.18,0.119   |
| <b>1992(2) b,s.e.</b>      | 1.86,0.375**               | 0.26,0.117*  | 0.88,0.367*  | 0.29,0.144*  | 0.89,0.377*              | 0.20,0.118+  |
| <b>tenure 1992(2)</b>      | 0.46,0.245+                | 0.10,0.077   | 0.66,0.256** | 0.28,0.089** | 0.20,0.245               | 0.07,0.081   |
| <b>F(1),F(2)</b>           | 3.53,3.46                  | 2.20,2.25    | 2.61,2.57    | 2.65,2.33    | 3.72,3.93                | 3.26,3.36    |
| <b>2006(1),b,s.e.</b>      | -0.16,0.213                | -0.03,0.082  | -0.01,0.264  | 0.11,0.093   | 0.11,0.269               | 0.23,0.094*  |
| <b>2006(2),b,s.e.</b>      | -0.04,0.212                | -0.01,0.078  | -0.03,0.262  | 0.14,0.093   | 0.17,0.264               | 0.26,0.096** |
| <b>tenure 2006(2)</b>      | 0.43,0.175*                | 0.07,0.063   | -0.03,0.211  | 0.09,0.076   | 0.29,0.212               | 0.20,0.084*  |
| <b>F(1),F(2)</b>           | 3.95,3.74                  | 2.10,2.11    | 2.62,2.65    | 2.44,2.57    | 3.58,3.70                | 4.11,4.21    |
| <b>2012(1),b,s.e.</b>      | -0.58,0.293*               | -0.06,0.117  | -0.21,0.432  | 0.06,0.143   | -0.41,0.369              | 0.19,0.154   |
| <b>2012(2),b,s.e.</b>      | -0.54,0.291+               | -0.05,0.115  | -0.19,0.433  | 0.07,0.139   | -0.38,0.368              | 0.20,0.143   |
| <b>F(1),F(2)</b>           | 2.87,3.04                  | 1.49,1.54    | 1.39,1.43    | 2.21,2.27    | 2.36,2.46                | 2.04,2.13    |
| <b>tenure 2012(2)</b>      | 0.21,0.239                 | 0.06,0.096   | 0.10,0.345   | 0.07,0.121   | -0.41,0.369              | 0.01,0.141   |
| <b>age 2012(1)-1992(1)</b> | -2.35,0.489**              | -0.31,0.170+ | -0.94,0.570  | -0.12,0.198  | -1.26,0.531*             | 0.01,0.195   |
| <b>age 2012(2)-1992(2)</b> | -2.31,0.475**              | -0.31,0.164+ | -1.07,0.568+ | -0.22,0.200  | -1.27,0.527*             | 0.00,0.185   |
| <b>tenure 2012-1992</b>    | -0.25,0.342                | -0.04,0.123  | -0.56,0.430  | -0.21,0.150  | -0.61,0.443              | -0.06,0.163  |

Note The age effects are estimated in regression models for all employees within class and year, and with complete controls (see text).

The tenure variable is a dummy that takes value 1 when the individual's tenure is above the median in the given year.

+ significant at the 10 % level; \* significant at the 5 % level; \*\* significant at the 1 per cent level.

F(1), F(2) refer to the model F-statistics for, respectively, the specification with and the specification without the tenure variable.

**Table 5. Age effects by class within year for models with(1) and without (2) tenure variable**

| class>           | managers and professionals |              | intermediate |              | semi-routine and routine |              |
|------------------|----------------------------|--------------|--------------|--------------|--------------------------|--------------|
|                  | OC                         | OJS          | OC           | OJS          | OC                       | OJS          |
| 1992(1) b, s.e.  | 1.77,0.391**               | 0.25,0.123*  | 0.73,0.372+  | 0.18,0.137   | 0.85,0.382*              | 0.18,0.119   |
| 1992(2) b,s.e.   | 1.86,0.375**               | 0.26,0.117*  | 0.88,0.367*  | 0.29,0.144*  | 0.89,0.377*              | 0.20,0.118+  |
| tenure 1992      | 0.46,0.245+                | 0.10,0.077   | 0.66,0.256** | 0.28,0.089** | 0.20,0.245               | 0.07,0.081   |
| F(1),F(2)        | 3.53,3.46                  | 2.20,2.25    | 2.61,2.57    | 2.65,2.33    | 3.72,3.93                | 3.26,3.36    |
| 2006(1),b,s.e.   | -0.16,0.213                | -0.03,0.082  | -0.01,0.264  | 0.11,0.093   | 0.11,0.269               | 0.23,0.094*  |
| 2006(2),b,s.e.   | -0.04,0.212                | -0.01,0.078  | -0.03,0.262  | 0.14,0.093   | 0.17,0.264               | 0.26,0.096** |
| tenure 2006      | 0.43,0.175*                | 0.07,0.063   | -0.03,0.211  | 0.09,0.076   | 0.29,0.212               | 0.20,0.084*  |
| F(1),F(2)        | 3.95,3.74                  | 2.10,2.11    | 2.62,2.65    | 2.44,2.57    | 3.58,3.70                | 4.11,4.21    |
| 2012(1),b,s.e.   | -0.58,0.293*               | -0.06,0.117  | -0.21,0.432  | 0.06,0.143   | -0.41,0.369              | 0.19,0.154   |
| 2012(2),b,s.e.   | -0.54,0.291+               | -0.05,0.115  | -0.19,0.433  | 0.07,0.139   | -0.38,0.368              | 0.20,0.143   |
| F(1),F(2)        | 2.87,3.04                  | 1.49,1.54    | 1.39,1.43    | 2.21,2.27    | 2.36,2.46                | 2.04,2.13    |
| tenure 2012      | 0.21,0.239                 | 0.06,0.096   | 0.10,0.345   | 0.07,0.121   | -0.41,0.369              | 0.01,0.141   |
| 2012(1)-1992(1)  | -2.35,0.489**              | -0.31,0.170+ | -0.94,0.570  | -0.12,0.198  | -1.26,0.531*             | 0.01,0.195   |
| 2012(2)-1992(2)  | -2.31,0.475**              | -0.31,0.164+ | -1.07,0.568+ | -0.22,0.200  | -1.27,0.527*             | 0.00,0.185   |
| tenure 2012-1992 | -0.25,0.342                | -0.04,0.123  | -0.56,0.430  | -0.21,0.150  | -0.61,0.443              | -0.06,0.163  |

Note 1: The age effects are estimated in models with pooled data for all employees within class and year.

Note 2: The tenure variable is a dummy that takes value 1 when the individual's tenure is above the median in the given year. For the use of a median split as a way of purging error in a regressor variable, see Wald (1940).

Note 3: + significant at the 10 % level; \* significant at the 5 % level; \*\* significant at the 1 per cent level.

Note 4: F(1), F(2) refer to the model F-statistics for, respectively, the specification with and the specification without the tenure variable

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