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Task Specificity and the Gender Wage Gap

Theoretical Considerations and Empirical Analysis of the Spanish Survey on Wage Structure

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Standard research on the wage gap tends to take, often implicitly, an individual human capital approach. As a result, the specificity of the tasks people are employed to perform is rarely incorporated in the analyses, and this is bound to yield mis-specified wage equations. Incorporating task-specificity factors in the wage models can advance our understanding of the mechanisms behind wage differences by sex. Decomposing the task-specificity model poses, however, some methodological problems. These problems are addressed and solutions are proposed. The model is then tested using individual data drawn from the Spanish Survey on Wage Structure. The empirical analysis is performed using a condensed version of Goldthorpe's class schema on the assumption that such schema captures crucial differences in task specificity. The paper ends with a discussion of the advantages of the task-specificity model over both standard human capital and cultural-feminist explanations of the gender wage gap, and calls for using direct measures of task specificity in future research.

Introduction

It is well known that in all capitalist societies women earn less than men. This difference is generally referred to as the wage gap and ranges roughly between 20 and 30 per cent. Since the seminal studies of Oaxaca (1973), Blinder (1973) and Mincer and Polachek (1974), most of the existing research has focused on identifying which part of the wage gap can be accounted for by differences in the labour market assets of men and women and which part is due to differences in the labour market returns that men and women obtain for the same type of assets. The former is usually referred to as the 'explained' component of the wage gap, whilst the latter, the so-called 'residual' component, is typically interpreted as reflecting discrimination in the market.

This paper defends two interrelated ideas. First, that over-stressing the role that individual human capital assets play in wage formation leads to the under-specification of the 'explained' component of the wage gap, which, in turn, tends, by the very logic of the decomposition method, to amplify the residual component – and hence to amplify the actual amount of discrimination perceived in the labour market. As a result, little is actually achieved in terms of causal explanation of the persisting differences in earnings by sex. Secondly, that, contrary to

what is often assumed in wage-gap research, rewards in the labour market are not only linked to individuals as bearers of human capital, but also – if not mainly – to the tasks they are employed to perform. The very nature of these tasks, given the available monitoring technology, generates different incentives for employers to implement different compensation schemes. Task-specificity, therefore, shapes the employment relation, irrespective of individuals' personal endowments. This implies that the observed returns to the same stock of individual skills will be very different depending on the nature of the tasks employees are paid to perform.

The idea that earnings are not only determined by personal characteristics but also by the characteristics of the job occupied is certainly not new in the literature (see e.g. Granovetter, 1981). Yet theories that can spell out which are the precise causal mechanisms that link the nature of job-tasks to rewards, net of personal attributes, have not been on hand until the development of personnel economics and transaction cost models of the employment contract (see e.g. Williamson, 1994, 1996; Lazear, 1995) and the related emergence of what could be termed rational action theories of class (see Sorensen, 1994, 2000; Breen, 1997; Goldthorpe, 2000: ch. X). This paper aims to contribute to this growing body of literature by exploring the impact of task specificity on the gender wage gap.

Therefore, the task-specificity approach (TSA) defended here shifts the attention from individual investment choices to the structural properties of job tasks and the employment relations they entail. Rather than pointing to supply and demand for particular skills as the main forces driving compensation, as in the human capital model, the TSA stresses that employers' strategies to minimise task-specific contractual hazard result in different compensation schemes. These compensation schemes are designed for particular 'jobs' rather than for particular 'workers'. Consequently, in this model, individual levels of productivity are seen as playing only a limited role in defining pecuniary compensation[1] – in fact, high compensation schemes might be deployed precisely in those instances where employees' productivity is difficult to measure (see below).

It follows from this model that if there is a pattern whereby men and women of the same characteristics are nevertheless channelled into jobs that entail very different levels of task specificity, wage models that do not account for task specificity will be under-specified. The uneven distribution of domestic labour and childcare existing in society can generate the opportunity structure that makes this differential channelling rational in economic terms for employees – as well as for employers. This differential channelling into high-task-specificity jobs could, therefore, account for a significant part of the observed wage gap.[2]

Thus, introducing task specificity to the wage models and explaining the gender differences in individuals' allocation in high-specificity tasks seem relevant steps to make in the direction of explaining the gender wage gap. Such a strategy, I will argue, has one theoretical advantage over the existing sociological theories that stress inter-group conflict,[3] cultural devaluation[4] or some other form of value differentiation[5] as the main sources of wage discrimination, namely, that it does not require the assumption of 'gendered rationalities'. In this sense, it can be said to provide a more efficient theory. It is also one that stresses the structural nature of gender inequality, as well as one that provides a more explicit causal connection between macro structures and micro behaviour.

At the empirical level, this study focuses only on the first step of this research agenda – i.e. the analysis of the causal connections that link the nature of jobs in terms of their task specificity to the gender wage gaps. This is done by drawing on the Spanish Survey on Wage Structure (*Encuesta de Estructura Salarial*, EES) carried out in 1995 to a representative sample of approximately 83,000 wage-earners employed in private firms (see INE, 1996). There is no reason to expect that the empirical findings are particular to the Spanish case.

Despite its unusually large sample size, the EES shares a very important limitation with the vast majority of the wage surveys currently available for researchers in that it lacks direct information on the exact nature of the tasks employees perform at their organisations. This limitation illustrates the important gap that currently exists in labour market research between theory and data. In practical terms, it implies that task specificity can only be imputed indirectly, using respondents' occupation as the main source of information. This has been done by drawing on a condensed version of John Goldthorpe's class schema, the theoretical rationale of which is based precisely on the two dimensions that account for task-specificity: monitorability and firm-asset specificity (see Goldthorpe, 2000: ch. X, and below). The empirical results obtained are, therefore, contingent upon the validity of such schema and should, therefore, be taken as preliminary, until direct indicators of task specificity are available.

The paper is organised as follows. In the first part the theoretical model is explained in three steps: first, the main characteristics and limitations of the standard decomposition approach are discussed; second, the crucial role that task-specificity factors play in determining

individuals' wages net of their human capital endowments is explained; and, third, the implications that task-specificity factors have for the gender wage gap are addressed. Then the paper moves on to test these implications empirically. This requires discussing some methodological issues regarding the decomposition of equations that contain multiplicative terms. After addressing these issues, the task-specificity model is tested against the standard human capital model using the EES. The paper concludes with a discussion of the main advantages of accounting for task-specificity factors in the analysis of the gender wage gap and calls for direct measures of task specificity in future wage-gap research.

The Decomposition Method

Most wage-gap research applies the decomposition method first proposed by Oaxaca (1973) and Blinder (1973). Conceptually, the logic that lies behind the decomposition approach could be described as follows. First, an idealised model of the labour market is assumed. This is typically some variation of the orthodox neoclassical market – 'corrected for' by a number of control variables – where individuals' human capital, understood as a set of personal skills, reigns as the main mechanism distributing pecuniary compensation. This idealised market is, by definition, a gender-neutral one so that pay differences in it only mirror the different 'stocks of skills' workers posses (Becker, 1971 [1957], 1993 [1964]; Mincer, 1974). In a second conceptual step, the decomposition method tests how closely the 'real world' resembles this ideal model. This is done by 'fitting' the gender-neutral model of wage formation to the actual data through the so-called 'explained' component of the wage gap, which represents the amount of the gap that is due to differences in the distribution of individual assets. The observed deviations from the predictions of the human capital model are then captured by the so-called 'residual' component, which measures the different returns that men and women obtain for the same stock of human capital. Since in the idealised model these returns should not differ by gender, this latter component is assumed to reflect discrimination in the labour market. Using our own notation, the decomposition model can be expressed as follows:

$$S_i^{\male} - S_i^{\female} = \beta^{\male}_i (X_i^{\male} - X_i^{\female}) + (\beta_i^{\male} - \beta_i^{\female}) X_i^{\female} \qquad (1)$$

where $S_i^{\male}$ is men's observed wages and $S_i^{\female}$ is women's; X_i represents a vector of personal assets; and β_i is a vector that captures the observed pecuniary returns to such assets – both personal assets and their observed returns are differentiated by sex. Hence, $S_i^{\male} - S_i^{\female}$ is the raw or uncorrected wage gap; $\beta^{\male}_i (X_i^{\male} - X_i^{\female})$ is the 'explained' part of the gap, and $(\beta_i^{\male} - \beta_i^{\female}) X_i^{\female}$ is the 'residual' or 'unexplained' component of the gap.[6]

Given such a definition of the problem, it seems apparent that the calculation of the magnitude of discrimination operating in a given labour market will depend on how accurately differences in assets are controlled for. In other words, the decomposition method implies, by its very logic, that gender differences in assets that pass unobserved or are incorrectly measured can end up appearing as differences in returns. Therefore, the crucial point for this indirect method of quantification lies in correctly identifying the assets that really matter for determining individual wages.

There are a handful of variables used in most wage-gap studies that are thought to capture these crucial assets. These are typically different measures of human capital, understood primarily as a reflection of individual endowments, plus control terms.[7] Human capital is generally measured using information on respondents' formal education and job experience. The former variable is seen as reflecting general human capital, whilst the latter is generally thought to capture specific human capital, both understood as individual assets.

It is, however, known that the same individual endowments too often lead to different returns depending on the type of employment relations employees engage in. Different explanations have been provided for this phenomenon, within the fields of stratification sociology (see e.g. Sorensen, 1994; Breen, 1997; Goldthorpe, 2000), personnel economics (Milgrom and Roberts, 1992; Lazear, 1995) and institutional economics (Williamson, 1985, 1994, 1996). All these explanations point at the importance of what has been called task-specificity factors in determining employee's rewards in ongoing employment relations (see Polavieja, 2001: ch. II, 2003).

Task specificity matters because transactions in the labour market take place in a context of asymmetric information, which makes employment contracts unavoidably incomplete. The degree of informational asymmetry depends greatly on the nature of the tasks workers are employed to perform. In other words, task specificity generates different degrees of contractual hazard. Compensation schemes are designed and implemented by employers to reduce such hazards and this has obvious implications for the structure of rewards.

The Importance of Task Specificity

There are two dimensions of the job task that have a crucial impact on both the form and the level of workers' pecuniary compensation: (i) monitorability and (ii) firm-asset specificity. These two dimensions play a crucial role in shaping the employment relation since all rational employers will seek to economise on monitoring costs and to secure whichever investments they have made in adapting employees' individual human capital to the specificity of the job task. The type of employment contract offered by rational profit-maximising employers will differ very substantially depending on these two crucial dimensions inherent to the very nature of the task.

In those instances where workers' productivity is very difficult to measure and where both employers and employees, given the specificity of the tasks required in their organisation, have to incur costly productivity-enhancement investments, contracts will typically take the form of what Goldthorpe (2000: ch. X) calls the 'service relation'. This type of employment relationship is characterised by high levels of employment security for the employee (since if s/he leaves the firm, the employer will have to incur on-the-job training investments again) and some system of compensation that can provide incentives for workers to put forward productive effort even when their productivity is not easily measurable. Career ladders in internal labour markets with efficiency or seniority wages are the usual means of inducing effort in a context of high task-specificity (see Sorensen, 2000; Polavieja, 2003 and below).

Task specificity can, therefore, be viewed as a key positional asset that determines the returns to standard human capital variables such as education, age or actual job experience (or tenure). The impact of task specificity on earnings will not be captured by focusing solely on such individual attributes. As I explain below, the fact that most analyses of the wage gap make no attempt to measure this crucial dimension of the wage distribution can have important consequences for the analysis of gender discrimination.

Occupation, Task Specificity and the Wage Gap

One could, however, argue that the above criticism – and hence the bulk of this paper – is largely unfounded, since jobs are already 'accounted for' by many of the existing models of the wage gap. Indeed, since the seminal work of Blinder (1973), many decomposition analyses do actually include respondents' occupation in the wage equations (see e.g. England *et al.*, 1994; Macpherson and Hirsch, 1995; Petersen and Morgan, 1995; Solberg and Laughlin, 1995; Petersen *et al.*, 1997). Is it, therefore, legitimate to claim that the nature of jobs is unaccounted for when detailed occupational titles are included in the equations? It certainly is.

Throwing numerous occupational dummies in the wage models does not amount to a test of the crucial factors that link task contents, employment contracts and rewards, and hence does little in the way of improving the specification of the wage equations. And this is because occupational title *per se* carries no theorised causal mechanism with it. What is actually tested when introducing occupational dummies remains, therefore, unclear. As a result, the debate between those in favour of introducing occupation in the wage models and those against it seems to revolve around the following problem pointed out by Kunze:

> Since the variable occupation may be the outcome of discriminatory processes in the labour market itself, inclusion of this variable may lead to an underestimate of discrimination. Vice versa, estimates of discrimination without controlling for occupation may be interpreted as an upper bound estimate of discrimination. . . . Kunze (2000: 50).

Tam (1997) adopts a different approach to merely controlling for occupational titles and, in so doing, deflects Kunze's problem. Using cross-sectional data from the 1988 US Current Population Survey, Tam showed that the observable impact of occupational sex segregation on wages disappeared entirely once both information on the average length of specific training required in each occupation and a set of industry dummies were introduced in the wage models. Information on the former variable was obtained using the Dictionary of Occupational Titles, which contains detailed information on the average occupation-specific training that is required in the US – be this training acquired through school, on the job or via vocational instruction.

Tam interpreted his findings as evidence against the existence of a cultural devaluation of women's jobs and in support for the standard human capital model. According to the latter, people who invest in specialised human capital face 'additional opportunity costs that may arise for forgone opportunities for recouping one's investment' (Tam, 2000: 1658–1659). These additional costs originate in the restricted applicability of specialised skills. In order to ensure the adequate supply of such

skills, employers must offer wage premiums that compensate for the additional costs of specialisation (see also Becker, 1993 [1964]: ch. III). Tam argues that women tend to concentrate in jobs that require less specialised human capital and hence do not benefit from such premiums to the same extent as men. This would explain why the wage impact of occupational segregation disappears after controlling for human capital specialisation.

Tam's research constitutes a very important contribution to the analysis of gender differences in earnings, at least for the following two reasons. First, because it questions the validity of cultural devaluation interpretations of the sex composition effects on wages, which has generated an important debate in the field (see e.g. England *et al.*, 2000; Tam, 2000; Tomaskovic-Devey and Skaggs, 2002); and, secondly because it illustrates the analytical pay-offs of getting closer to measuring the exact nature of people's jobs. Unfortunately, however, Tam does not use his unusually rich dataset to decompose the wage gap, which renders his analysis empirically incomplete, at least for the purposes of the current discussion.[8]

Tam's study could also be subjected to criticism from within the human capital ranks, as it disregards firm-specific human capital, which is the central dimension of Becker's original model, in favour of rather secondary dimensions of human capital specificity such as occupational and industrial specialisation (see Becker, 1993 [1964]: ch. III).[9] Tam justifies this decision for practical rather than theoretical reasons (Tam, 1997: 1657, ft. 9).

Yet the principal point of discrepancy between Tam's model and the task-specificity model defended here is that, in the former, specialised human capital is treated as a personal asset, whose wage premium depends on supply and demand forces that operate in abstraction of the structural properties of the tasks employees perform, whilst in the latter these structural properties provide the basis for wage discrepancies amongst workers of identical assets. Tam's study cannot settle this theoretical dispute, as it did not set out to do so.

In short, neither the standard method of controlling for occupations in the wage equations nor Tam's much more refined analytical strategy can provide a test for the task-specificity model, whose implications for the wage gap I now turn to discuss in greater detail.

Task Specificity and the Gender Wage Gap

It follows from the above discussion that for task-specificity factors to enhance our understanding of the wage-gap the following two conditions should be met: (i) that accounting for task-specificity factors provokes a reduction of the residual component of the wage gap in the empirical models; and (ii) that an explanation linking gender to the probability of occupying high (low) specificity tasks be provided. In other words, if high task specificity results in higher wages and if women are less likely to occupy high asset-specificity jobs than men of similar characteristics, then introducing task specificity in the models will reduce the discrimination component of the gap. If this is the case, understanding why women are less likely to occupy high asset-specificity jobs than men of similar characteristics becomes crucial for the explanation of the wage gap.

There exists sufficient empirical evidence to conclude that the bulk of the gender wage gap is due to what Petersen and Morgan (1995) call allocative and valuative processes, that is, to the processes that link women to particular jobs and the ways in which these jobs are rewarded in monetary terms (see e.g. Lazear, 1995: 93; Petersen and Morgan, 1995; Petersen *et al.*, 1997). There are reasons to believe that both of these processes are linked to task specificity.

There are jobs that require investments on the part of both employers and employees due to what Williamson (1985, 1996) calls the 'specificity of the assets' required for the performance of the task. Except when such investments are transferable to other firms (or other workers) at low costs, which is rare, the benefits can only be realised to the extent that the employment relation is maintained (Williamson, 1985: 62). This provides strong incentives for the use of open-ended contracts to ensure that the investments made by both parties can be realised.

The distribution of asset specificity across different tasks has, therefore, 'large and systematic organisational ramifications' (Williamson, 1985: 53). This is mainly because, whilst securing the employment relation, open-ended contracts might also favour shirking and free-riding. In order to avoid this agency problem, rational employers will have to design an incentive structure that acts as a mechanism for effort extraction. When neither workers' input to the task nor their output are easily measurable – hence the importance of measurability – the form that wage compensation takes over the employee's career can be used in itself as an incentive device (see Sorensen, 2000). One possible incentive strategy might consist of offering above-market wages as a means to penalise job losses and to promote workers' commitment to the firm. Efficiency wages will increase the penalty associated with unemployment and hence promote effort (for a review see Akerloff and Yellen, 1986).

Yet probably the most efficient form of providing incentives through the wage system, in a context of closed employment relations, is offering a form of monetary compensation that increases with employee's tenure along the lines of a well-defined career ladder. This increasing level of compensation acts as a 'carrot', which can ensure workers' effort, promote loyalty and encourage further on-the-job training in a context of long-term employment relations and high monitoring costs – as in efficiency-wage models, the 'stick' is the threat of unemployment.

Note that the ideal compensation system, from the firm's point of view, is one in which employers offer workers wages below their actual productivity (P*) in the very early stages of the employment career in exchange for above-market wages as the employment relation progresses, so as to minimise the overall costs of wage incentives (Sorensen, 2000). Plot A in Figure 1 shows this ideal system of compensation for high-specificity tasks.

Human capital approaches tend to view this system of compensation as dependent on individuals' levels of specific human capital – i.e. as dependent on what happens to their employees' 'stock of skills' as they accumulate tenure (see e.g. Zellner, 1975; Polachek, 1981; Becker, 1985, 1993 [1964]; Tam 1997). In contrast, the TSA is agnostic with respect to what happens to individual productivity over time. Moreover, it stresses that tenure-dependent wage premiums are more likely to occur precisely in those instances where workers' productivity is less observable, an assertion that seems irreconcilable with human capital predictions.

It therefore follows from the TSA that employers need not reward the same skill stock for tasks where monitoring costs and asset specificity are both low. In those instances they can pay wages that are much more closely linked to productivity. Hence, wages in low-specificity tasks (B) will be much closer to the flatter rate of the market (P*) (see also Goldthorpe, 2000: ch. X).

Tenure-dependent systems of compensation penalise employment discontinuity to a much greater extent than the flatter system for low-specificity tasks.[10] It thus follows that if workers never go beyond, say, unit 5 of tenure, they will actually be better off opting for system B. Moreover, to the extent that asset specificity is bound to a particular organisational context, job disruptions mean that employees will have to incur new on-the-job training investments if they re-enter high task-specificity employment. This type of opportunity cost should also be added to the lower pecuniary compensation found in A during the first stages of the evolving employment relation. This implies that rational employees who wish/fear or otherwise envisage discontinuous careers will tend to choose job B over job A.

It is important to note that, in this model, the wage penalty associated with discontinuity is not linked to the atrophy or depreciation of individual human capital as in the theory of Polachek (1981) (see also Zellner, 1975), but rather to the degree of monitorability and asset spec-

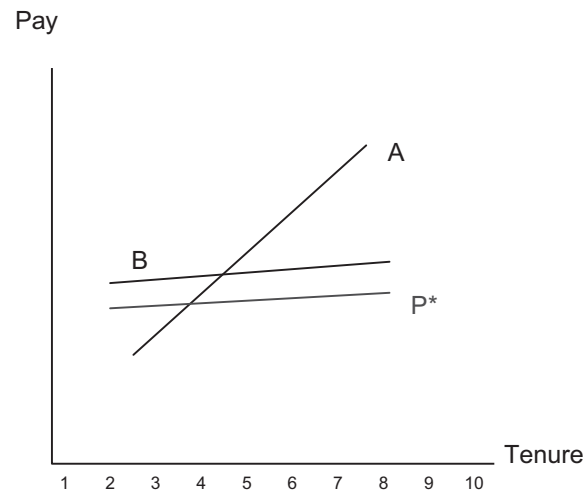

Figure 1 A tenure-dependent system of compensation for high-specificity tasks (A), a flat(ter)-rate system for low task-specificity (B) and the market price (P*)

ificity of the tasks employees perform. It is, in other words, a characteristic of the job, understood as a structural position, not of the individual agent. The point in both models is, however, that if women know *ex ante* that their labour market trajectories are likely to be discontinuous they might rationally choose the types of jobs where the penalty for discontinuity is lower. This could explain why, when compared to men, 'women are found in occupations requiring about the same level of formal education but offering less on-the-job training' (Stanek Kilbourne *et al*., 1994: 691) (see also Corcoran, 1979; England, 1992; Reskin, 1993: 258).

Here family/domestic responsibilities are crucial since a different distribution of the household burden could yield different economic calculations. Yet, taken the sexual division of labour as given, this type of rational economic calculation could explain career-relevant job choices without having to resort to cultural/socialisation explanations.

Note also that statistical discrimination on the part of employers – however ethically despicable or illegal – will become economically rational if, on average, women's labour market careers are more disruptive than men's and there is no compensating system that facilitates the re-incorporation to high-task-specificity jobs after spells out of employment – typically, governmental policies.

A further implication of this line of reasoning is that the sexual division of labour within households can itself be seen as a rational response to a labour market that penalises disruptions in high-task-specificity jobs and uses statistical discrimination as a mechanism of allocation. A family deciding how to allocate effort between the market and the household will be optimising on the structural opportunities offered to each of its members by the former if the male partner invests in the market (since the costs for him will be lower) while the female partner invests in domestic unpaid work (or chooses a combination of the latter and work on low-task-specificity jobs). Childbearing increases the benefits of such a strategy – particularly if family-friendly policies and childcare services are absent.[11] Economic incentives act, therefore, as powerful structural mechanisms that reinforce the traditional division of labour both in the market and within the household. Note that, in this model, 'feminist' couples will have the same economic incentives to behave traditionally, i.e. they will face the same costs if they do not, as 'traditional' ones. Labour market outcomes do not need to be explained by resorting to processes of gender socialisation/cultural dominance.

In what follows, the link between task specificity and the gender wage gap is analysed empirically using data for the Spanish case. Before presenting the empirical findings some methodological questions need to be addressed.

Methodological Implications of Testing the Task-Specificity Model

The standard Oaxaca–Blinder decomposition method (SDM) for the analysis of wage gaps has two important limitations when it comes to testing the impact of task-specificity factors. Firstly, the SDM is inadequate for calculating the separate contributions of discrete variables (see Nielsen, 1998). This limitation is rarely mentioned in the empirical literature, despite the fact that the use of discrete variables – if only as control variables – is widespread in wage-gap research. Secondly, the SDM does not account for interactions, since the methodological basis of this approach does in fact presuppose that the different explanatory variables have an additive, not a multiplicative, contribution to individuals' wages. I now discuss both limitations in greater detail and explain the method I have chosen to overcome them.

The problem with discrete variables is that the calculation of their contribution to both the explained and unexplained components of the gap is clearly sensitive to the choice of reference group. Let us denote the explained component e and the unexplained component u and assume for simplicity that our wage equation has only two variables: $X^g_i = \{C^g_i, D^g_{ji}\}$, $g = ♂, ♀$; where C is a continuous variable and D is a discrete variable with j number of values. The parameter vectors are $\beta^g_i = \{\beta^g_0, \beta^g_1, \beta^g_{k2}\}$, $g = ♂, ♀$, $k = j - 1$. Wages (Y) can thus be expressed as:

$$Y^g_i = \beta^g_0 + \beta^g_1 C^g_i + \beta^g_{k2} D^g_{ki} + \varepsilon^g_i, \quad \text{where } i = 1, \ldots N_g \quad (2)$$

The specific contribution to e from the p^{th} parameter should then be calculated as:

$$e_p = \beta^{♂}_{pi}(X_{pi}^{♂} - X_{pi}^{♀}), \qquad p = 1,2 \qquad (3)$$

Whilst the specific contribution from the p^{th} parameter to u should be:

$$u_p = (\beta_p^{♂} - \beta_p^{♀})X_p^{♀}, \qquad p = 0,1,2 \qquad (4)$$

This implies that in order to evaluate the contribution of D to both the explained and unexplained gender gaps, different decomposition calculations should be made for each of the dummies of the D set. In other words, one

single decomposition analysis will only capture the contributions to the gaps of the reference group being used (i.e. for $j=0$). This is, to repeat, seldom recognised in empirical research.[12]

Most importantly, the SDM assumes that the effect of C on *e* and *u* is the same regardless of the value of D, as equation (2) shows. The SDM was originally devised for continuous variables and did not allow for interaction effects. These assumptions (i.e. continuous input variables and additive effects) prove very convenient from a strictly technical point of view. The problem is that they are fully incompatible with the task-specificity model outlined above, since this model predicts that individual endowments – tenure, in particular – will have a different value depending on the characteristics of the tasks employees perform. Assuming that C stands for tenure and D for task-specificity, the causal effects represented in Figure 1 can be expressed as follows:[13]

$$Y^g_i = \beta^g_0 + \beta^g_1 C^g_i + \beta^g_{k2} D^g_{ki} + \beta^g_{k3} D^g_{ki} C^g_{ki} + \varepsilon^g_i \quad (5)$$

This conditional equation is far more complex than the original wage model that provided the basis for the SDM. Decomposing equation (5) becomes a rather convoluted task and poses some presentational difficulties.[14] Yet, as it has been argued above – and will be shown in the next section – that the task-specificity model, which can be fitted through equation (5) (and other extensions of it), provides a better description of reality than the additive assumptions of the SDM. Consequently, ignoring these conditional effects for the sake of simplicity would only be possible at the expense of explanation.[15]

The main methodological problem is how to better decompose the interacted term(s) $\beta^g_{k2} D^g_{ki} + \beta^g_{k3} D^g_{ki} C^g_{ki}$. The simplest methodological solution to this problem is to fit $g \times j$ different equations to the data and to use the values of the parameters obtained in this way as the basis for decomposition. Hence, the contribution of C to the main component would be calculated as follows:

$$e_j = \beta^{\male}_{cji}(C_{ji}^{\male} - C_{ji}^{\female}), \qquad j = 1,2,3 \qquad (6)$$

Whilst the specific contribution of C to the residual component would be:

$$u_j = (\beta^{\male}_{cji} - \beta^{\female}_{cji}) C_{ji}^{\female}, \qquad j = 1,2,3 \qquad (7)$$

Note that expressions (6) and (7) are specific to j, that is, they are applied to and calculated for each of the values of the D set. This implies that, instead of a single value for *e* and *u*, we will obtain j number of gap values.

Data and Operationalisation of Variables

The Spanish Survey on Wage Structure (EES) was carried out in 1995 by the Spanish Institute of Statistics in the framework of the European Union with common methodology and content criteria, with the objective of obtaining some comparable results on the structure and distribution of wages among its member states. The EES investigates the distribution of wages based on a large variety of variables such as sex, occupation, activity branch, age or size of the company. It is based on a representative sample of 83,220 wage earners employed in private Spanish firms. The rate of response was around 95 per cent (see Table 1 for descriptive statistics).

Despite its obvious advantages, the EES shares with most (if not all) existing datasets an important limitation when it comes to testing the task-specificity model, namely, that it lacks direct measures of the nature of the job tasks people perform within their organisations and, in particular, of the crucial dimensions that define task specificity: monitorability and firm-asset-specificity. This obviously poses a serious problem to the testing of the TSA.

In order to surmount this problem we have very few options but to use theoretically driven indicators of task specificity that are based on respondents' occupation. The well-known EGP schema (see Erikson *et al*., 1979) can be used to this end, since, as Goldthorpe (2000: ch. X) explains, it is the very dimensions of monitorability and asset-specificity which provide the rational basis for the differentiation of employment contracts represented in the EGP.

Hence, the task-specificity variable used in the following section is a condensed version of the EGP with the following three values: high task specificity (classes I and II of the EGP), medium task specificity (classes IIIa and V), and low task specificity (classes VI, VIIa, VIIb and IIIb), which are the values that more closely correspond to Goldthorpe's theoretical discussion on the differentiation of employment contracts (see Figure 2).

The empirical analysis presented in this study rests on the assumption that the condensed version of Goldthorpe's class model is a valid and reliable operationalisation of both monitorability and firm asset specificity. Should this prove not to be the case, our results would be invalid.[16] A considerable degree of caution is,

Table 1 Description of variables, EES (1995)

Variables	Description	Men Mean(SD)	Women Mean(SD)
Hourly wages	Hourly wages is the ratio of weekly wages and usual weekly hours in 1995 pesetas	1306 (978)	973 (636)
Age		39.5 (11)	34.6 (9.9)
Tenure	Years with current employer	10.8 (10)	8.4 (8.6)
Education Index	A 5-interval index based on the highest level of education achieved[a]	1.5 (0.8)	1.6 (0.8)
Fixed-term contract	0 = Permanent contract	25.5	30.2
Firm-level bargaining	0 = otherwise	19.3	14.4
Firms' product market:			
Local		36.8	29
National		52.5	60.2
UE or International		10.6	10.8
Firm's size	Number of employees		
10–19		27.4	22.6
20–49		30.8	25.1
50–99		9.4	11.8
100–199		5.6	7.6
200+		26.8	32.9
Task-specificity	Based on a condensed version of the EGP schema		
High	(Classes I and II)	17.6	12.4
Medium	(Classes IIIa and V)	20.5	42.9
Low	(Classes VI, VII and IIIb)	61.9	44.6
Total number of cases		62,806	20,414

Not listed are 18 autonomous communities.

[a]*The education index has the following values: 1. Primary; 2. Secondary; 3. Lower tertiary; 4. Tertiary; and 5. Higher tertiary.*

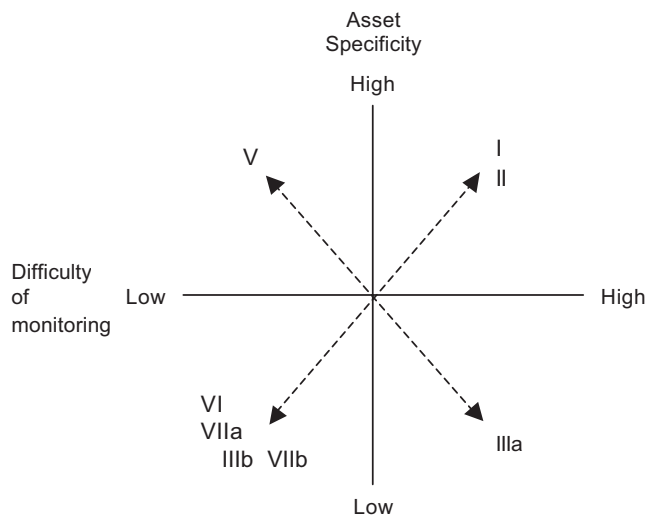

Figure 2 Dimensions of work as sources of contractual hazard, and location of employee classes of the EGP schema according to Goldthorpe (2000)

therefore, recommended when interpreting the empirical results.

Empirical Findings

In this section the TSA is tested in two different steps. First, the model is fitted to the overall population (men and women included) in order to test its explanatory performance against the competing human capital model. This is done using a series of standard OLS regressions on the log of hourly wages within a model-building framework. Secondly, the results of decomposing the task-specificity model and the human capital model, represented by their respective OLS equations, are compared by calculating the total, explained and unexplained gaps that each equation model yields.

The first step thus implies testing whether the task-specificity model does indeed hold as an accurate explanation of the Spanish wage structure as a whole. The crucial point here is providing evidence that the returns to individual endowments such as tenure (as a proxy for specific human capital) and education differ significantly depending on the type of tasks workers perform. For the sake of simplicity, an interval education scale has been used.[17]

Table 2 shows the results of fitting three different equation models to the complete dataset. Note that, as expected, a model controlling for an interaction between task specificity (measured using the EGP3) and tenure plus an interaction between task specificity and education provides a better explanation of the Spanish wage structure in 1995 than its competitors. Table 2 can be read in terms of model building. Model 1 is the simplest model, which captures the standard human capital story. Model 2 adds task specificity to model 1. The significance of the parameters of the EGP3 are consistent with the idea that task-specificity factors (i.e. the nature of the jobs people do) have a clear impact on what they get net of their human capital endowments. Model 2 is, however, an additive model which provides an ultimately inaccurate representation of the task-specificity model formalised in equation (**5**) above. Equation (**5**) was expressed as an interaction between task specificity and human capital variables. Model 3 tests for this interaction in the data and finds results that are consistent with the theory. Model 3 shows that individual market returns to both education and tenure are significantly higher for high-specificity tasks than for low-specificity tasks. This is line with the idea that task specificity acts as a positional asset that determines the monetary value of individual human capital endowments.

But how does task specificity affect the size of the wage gap? In order to answer this question one needs to compare the results of decomposing the standard human capital model (model 1 of Table 2) and those obtained by decomposing the interacted task-specificity model (model 3 of Table 2). This implies fitting two different equations for each model, one for men and one for women, which are then used as the basis for decomposition, using the method explained above. For the sake of simplicity, only the main results of decomposition are presented in Table 3 and also graphically in Figures 3 and 4 below.

According to the results obtained from decomposing the standard human capital model (model 1), the average hourly wage for male Spanish employees in 1995 was 1157 pesetas, whilst the average hourly wage for their female counterparts was 894 pesetas. This implies a raw gender gap of 263 pesetas or 22.7 per cent. After decomposing this gap, it is found that only 16 per cent of the raw difference is due to differences in individual assets (in particular, individuals' age), the rest, that is 84 per cent of the raw gap, remains unaccounted for. In other words, using the standard method of decomposition for the standard human capital model, it would appear that gender discrimination (defined as the unexplained component of the gap) reached as much as 19.7 per cent in 1995 Spain.[18]

Yet rather different results are obtained when the task-specificity model is used as the basis for decomposition. The task-specificity model yields a raw gender gap of 14.8 per cent when all the discrete variables of the model are set to 0. Most importantly, the residual component of the gap obtained from decomposing the task-specificity model is now 9 per cent, which is 52 per cent smaller than the discrimination figure obtained on the basis of the standard model of decomposition (see Figure 3 and Table 3).

It is, however, crucial to stress that these findings are specific to the reference category used in the interaction terms, that is, to employees in high-specificity tasks (classes I and II of the EGP). This is because, as has been explained, model 3 is an interaction effect equation, which means that the size and composition of the gender gaps are themselves dependent on the types of tasks employees perform. This is a central idea of the task-specificity model. The results of decomposing the different gender gaps for each of the three levels of task specificity are presented graphically in Figure 4.

Table 2 OLS regressions on the log of hourly wages, Spain (1995)

All respondents	**Model 1** Coeff. Sig	**Model 2** Coeff. Sig	**Model 3** Coeff. Sig
Female	−0.238***	−0.242***	−0.236***
Age	0.009***	0.008***	0.008***
Tenure	0.007***	0.007***	0.009***
Education Index	0.229***	0.136***	0.171***
Task-specificity (Ref.: High)			
Medium		−0.261***	−0.149***
Low		−0.385***	−0.193***
Temporary contract	−0.158***	−0.128***	−0.144***
Firm's Market (Ref.: Local)			
National	−0.091***	−0.090***	−0.091***
UE and International	−0.057***	−0.029***	−0.029***
Firm-level bargaining	0.024***	0.055***	0.064***
Size of the firm (Ref.: 10–19 employees)			
20–49	−0.058***	−0.059***	−0.059***
50–99	0.063***	0.059***	0.058***
100–199	0.109***	0.104***	0.103***
200+	0.207***	0.200***	0.199***
Public ownership of firm	0.316***	0.255***	0.247***
Task-specificity × tenure (Ref.: High)			
Medium × tenure			0.001
Low × tenure			−0.006***
Task-specificity × education index (Ref.: High)			
Medium × education			−0.053***
Low × education			−0.067***
Constant	6.283***	6.743***	6.63***
N	82,730	82,730	82,730
Adjusted R^2	0.4675	0.5053	0.5096
Likelihood ratio test: (assumption: model 2 is nested in model 3)			
LR chi^2 (4) =	720.41		
Prob > chi^2 =	0.0000		

Source: Calculated by the author from Encuesta de Estructura Salarial 1995 (INE, 1996).
All models control for autonomous community of residence (not shown due of lack of space). High-specificity tasks are: directors, managers and professionals (all included in categories I and II of the EGP). Medium-specificity task are: lower-level technicians and supervisiors (category V of EGP) and intermediate administrative tasks (category IIIa of EGP). Low-specificity tasks are: all manual occupations (VI and VII of EGP) and service proletariats (IIIb of EGP).
****Significance ≤ 0.01.*

Figure 4 shows that the largest raw and, in particular, unexplained gaps are found amongst workers performing low-specificity tasks, where returns on education, age and tenure are smaller. The size of these gaps decreases as task specificity increases. This is particularly true of the unexplained component, which is three times smaller in high-specificity tasks than in low-specificity tasks. In other words, returns to individual assets (age, education and tenure) are not only significantly larger but also more gender equal in high-specificity tasks. This implies that a greater channelling of women into high-specificity tasks would result in a reduction of the gender wage gaps – and, in particular, of the unexplained component.

The empirical findings seem, therefore, consistent with the part of the task-specificity theory that links job tasks, individual endowments and monetary rewards. A significant part of what standard human capital models attribute to discrimination can in fact be explained by the higher monetary returns to education and tenure observed in high-specificity tasks when compared to medium- and low-specificity tasks. These tasks have been defined according to their degree of monitorability and asset specificity, two dimensions which unfortunately

Table 3 Wage decomposition (in per cent)

	Standard human capital model			Task-specificity model (for reference categories)		
	Assets (per cent)	Returns (per cent)	Total (per cent)	Assets (per cent)	Returns (per cent)	Total (per cent)
Age	18.33	35.21	53.55	48.30	17.29	65.59
Tenure	5.01	−22.07	−17.06	4.38	−6.40	−2.01
Educational index	−7.21	11.35	4.13	−14.42	34.41	19.98
Constant	0.00	59.38	59.38	0.00	16.44	16.44
Total	16.14	83.86	100.0	38.26	61.74	100.0
Raw gap	22.7			14.8		
Unexplained gap	19.07			9.2		

Source: Decomposition from models 1 and 3 of Table 2.
Each cell value represents the percentage of the observed mean wage difference by sex that can be accounted for by the variable (rows) and each of the gap components (columns). Calculations have been made for all control variables = 0. Hence the results for task-specificity models refer to individuals employed in high-specificity tasks.

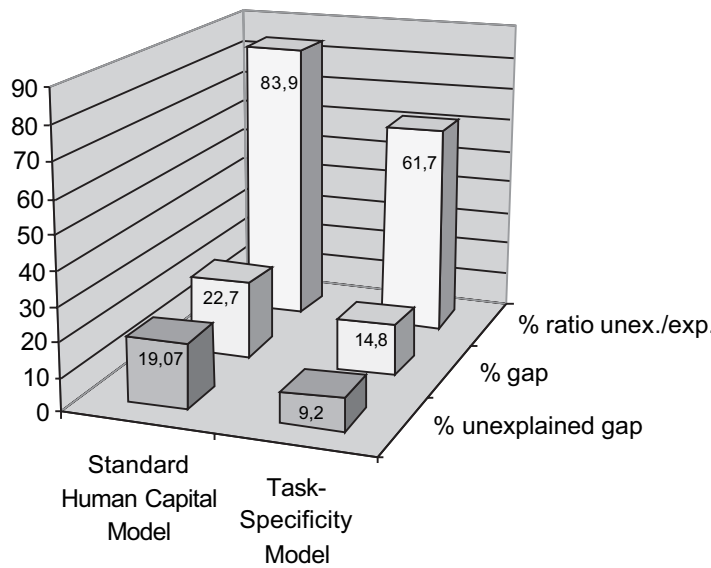

Figure 3 Reduction of the gender gap after controlling for task-specificity (EGP3) (calculations for the reference categories)

are hardly ever measured directly and were not measured directly in the EES.

This implies that the empirical results obtained must be taken as preliminary and inconclusive as they are based on the assumption that Goldthorpe's class schema does indeed capture differences in task specificity correctly, a matter which has not been sufficiently investigated to date. Only more refined and direct indicators of job characteristics will allow for a direct test of the TSA against competing explanations of the gender wage gap. Designing analytical strategies that allow for a (more) direct testing of the TSA is the obvious avenue for future research.

Similarly important is finding evidence on the relationship between the division of domestic labour and job choices, which is the second pillar of the task-specificity argument, and which has not been explored in this paper. To be sure, the study of sex differences in allocation has also been a prolific line of research, yet I believe it is one in which theoretical controversies have not been

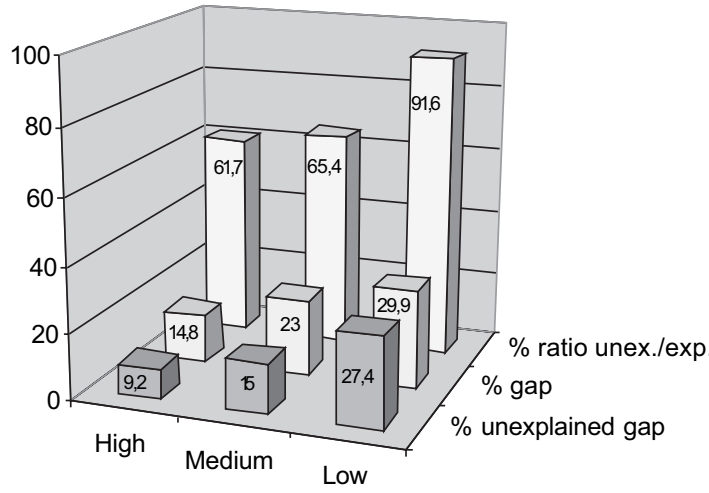

Figure 4 Gender gaps (in per cent) by task-specificity according to the decomposition of model 3 in Table 3

dissipated by empirical evidence (see e.g. Reskin, 1993: 257–60; Tam, 1997, 2000; England *et al.*, 2000). More refined and direct indicators of people's job tasks should also yield considerable pay-offs in this area of analysis.

Discussion

In contrast to human capital models, the task-specificity approach defended here accounts for the net impact of jobs, understood as structural positions, on the wage determination process. Accounting for task specificity removes the emphasis from individual assets and places it on the very nature of the job tasks; and this without abandoning the centrality of rational action as the ultimate principle that governs individuals' transactions in the market. There are theoretical reasons to believe that, by so doing, the 'explained' component of the wage gap can be better specified, which should ensure a more accurate measurement of the residual component.

On the assumption that a condensed version of the EGP class schema reflects differences in task specificity at the job level, as has indeed been argued by Goldthorpe (2000: ch. X), the empirical evidence provided in this paper has been interpreted as consistent with the task-specificity model. On the one hand, it has been shown that wage equations that account for an interaction between a condensed version of the EGP and individual human capital assets offer a better explanation of the Spanish wage structure than competing models. On the other, it has also been shown that these interacted equations have implications for the wage gap and, in particular, for the residual component. Both the raw and the residual gaps by gender are smaller in high-specificity tasks (classes I and II of the EGP). This empirical evidence must, however, be taken as inconclusive until direct indicators of task specificity become available.

The task-specificity model defended here also distances itself from what Stanek Kilbourne *et al.* (1994) have termed cultural-feminist approaches. These approaches stress the centrality of gendered devaluation processes in generating the wage gap.[19] The core argument of cultural-feminists is that 'social roles (including occupations) and skills that are associated with women are culturally devalued relative to those associated with men' (Stanek Kilbourne *et al.*, 1994: 694) and that this devaluation is the ultimate origin of wage discrimination. Without neglecting the possibility that such 'cultural' processes do indeed play an important role in generating the gender wage gap, and admitting that the empirical findings shown above are also open to 'cultural' interpretations, I believe that the task-specificity model offers an alternative explanation, which has the virtue of being more economical.

The task-specificity model is more economical because it requires considerably fewer assumptions concerning individuals' motivations for their actions than cultural-feminist theories. It is also more economical in the very sense of the word, as it stresses the fundamental role that pure cost–benefit calculations play in shaping labour market choices at the micro level. Explaining social behaviour through some form of more or less universally shared rationality (i.e. profit maximising) seems more efficient than resorting to differences in values,

codes or cultures. When, as in this case, what needs to be explained pertains to the domain of economic behaviour, the assumption of profit-maximising agents seems ever more persuasive.

Task specificity thus provides an alternative model to both human capital and cultural-feminist theories of the wage gap, without abandoning the centrality of rational action or disregarding the structural dimension of gender inequality. The 'structures' that matter here are not cultural processes of gendered socialisation or male dominance within organisations but rather the interplay of the structural properties of the employment contract on the one hand, and the existing division of domestic labour on the other.

Assessing the extent to which the heart of the wage-gap matter lies at actors' gendered values or at the actual economic constraints and opportunities they face is not a metaphysical question, but one that might have very clear policy implications. This is why theoretically-informed good-quality data is particularly wanting in this area of sociological inquiry. The more we know about what people actually do, the better we will be able to understand why they get what they get.

Notes

1. A further difference between the TSA and standard human capital models is that the former does not consider workers' input as completely exogenous to the task, since the incentive properties of the different compensation schemes devised in response to task-specific contractual hazards are meant to affect employees' input to the production process (see also Bowles *et al.*, 2001).
2. This is very similar to the standard human capital expectation that, given the division of domestic labour, women will be more likely to select themselves into particular jobs that entail lower returns to tenure (see Mincer and Polachek, 1974; Polacek, 1981; Tam, 1997) (for a critical review see Reskin, 1993). The main difference, however, is that for human capital theory women's overrepresentation in certain jobs reflects their willingness to minimise skill depreciation, whereas for the TSA the crucial element is the compensation package that each job entails, irrespective of what happens to the productivity of their incumbents.
3. See e.g. Reskin (1988), Martin (1992), Tomaskovic-Devey (1993), Jackman (1994), Cohen *et al.* (1998), Tilly (1998), Hultin and Szulkin (2003).
4. See e.g. England (1984, 1992), England *et al.* (1988, 1994), Reskin (1988), Stainberg (1990), Stanek Kilbourne *et al.* (1994).
5. See, in particular, Hakim's work on employment commitment (Hakim, 1991).
6. For the purposes of this paper, we need not take into consideration the overall wage distribution which, as has been demonstrated, has a significant impact on the wage gap (see e.g. Juhn *et al.*, 1993; Bernhardt *et al.*, 1995; Blau and Khan, 1997; Datta Gupta *et al.*, 2003).
7. Even when, as most often happens, wage equations include other organisational-level variables, such as type of activity or firm's ownership, their contribution to the 'explanation' of the wage gap is rarely mentioned. Together with geographical location, firm-level variables are generally taken as a mere control. Tam (1997: 1661) warns against the extensive use of control terms.
8. This has led Tomaskovic-Devey and Skaggs (2002: 106) to suspect that 'a very large proportion of the gender gap in wages remains unexplained' in Tam's model.
9. It must also be noted that Tam does not measure industry-specific human capital but merely controls for industry dummies, which is certainly not the same.
10. Figure 1 allows some room for efficiency wages in system B and some, although very limited, effect of tenure, as a result of increasing productivity due to specific human capital gains, as in Goldin and Polachek (1987).
11. Institutional factors can affect women's beliefs about the existing risks of career disruption and hence play an important role in shaping their job choices. For a detailed discussion on belief adaptation and career choices see Breen and Garcia-Penalosa (2002).
12. Nielsen (1998) has proposed a method to calculate the overall contribution of the discrete variable by calculating what she calls the implicit constant term.
13. Equation (5) can be extended to incorporate more continuous variables plus a vector of control terms.
14. Note that the decomposition of equation (5) amounts to the calculation of a three-dimensional interaction between task specificity, (whichever) individual endowments expressed in intervals and gender.
15. In presenting the empirical findings I have sought to achieve the maximum clarity possible within the realms of the decomposition paradigm. Outside this paradigm, statistical simulation techniques

seem the most appealing alternative for this type of research (see King *et al.*, 2000).

16. Evans (1992) tested the validity of the EGP and obtained largely positive results, yet more recent work by Evans and Mills (2000) has been somewhat less supportive.
17. Results do not change if one introduces educational dummies in the equation but this latter option complicates the decomposition calculations to follow enormously.
18. These gap figures can be compared to those found by other researchers in the Spanish case. For a comprehensive review of the existing literature on the wage gap in Spain and an alternative empirical analysis of the EES see Lago (2002).
19. See e.g. England (1984, 1992), England *et al.* (1988, 1994), Reskin (1993), Stainberg (1990), Stanek Kilbourne *et al.* (1994).

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