# Testing the validity of the Goldthorpe class schema

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ABSTRACT Goldthorpe's class schema is arguably the most influential conceptualization and operationalization of social class in European sociology. However, as of yet there is no study of the schema's validity. The aim of this paper is to test the criterion-related validity of the employee classes within the schema by examining their association with a range of relevant occupational characteristics. Using data from a British national probability survey it is shown that the schema predicts those characteristics—employment and payment conditions and future prospects—which are considered central to Goldthorpe's concept of class, as well as secondary distinguishing characteristics of classes; control over work activities, authority relations, and levels of pay. Moreover, the finding of a particularly strong association between class and indicators of employment conditions, is consistent with the key distinction—between a service relationship and a labour contract—embodied in the schema. Overall, the data provide support for the division of the schema into a hierarchy of service, intermediate, and working classes. In addition, it is shown that most methods of aggregation have only minor consequences for the validity of the schema, although in some cases there is a reduction in its predictive power. It is concluded that the schema operationalizes the basic principles of Goldthorpe's conceptualization of the class structure. The only minor deviation from the pattern of divisions embodied in the schema is the failure to find clear differences between the employment relations of skilled workers (class VI) and semi- and unskilled workers (class VII), and between classes I and II. This supports the strategy of aggregating those pairs of classes to form the 'salariat' and the 'working class'.

## INTRODUCTION: MEASURES OF CLASS AND THE NEED FOR TESTS OF VALIDITY

The development of valid and reliable measures of important concepts is a distinguishing characteristic of a successful science. Social class is a central concept in sociology, arguably *the* central concept of sociology. The validation of measures of social class is therefore a necessary step in the development of sociology as an empirically grounded social science. Nevertheless, although there are many studies which examine the fruitfulness of social class for predicting sociological phenomena such as voting behaviour, health, educational success, and psychological functioning, there are far less which directly test the validity of class schemata. Without such tests the study of stratification is unlikely to attain a desirable level of reliability and standardization, rather, it will remain an area characterized by measures of a more or less ill-specified and arbitrary nature.

Examples of such measures are numerous. In Britain, commonly used measures of social class include the Registrar General's occupational classification, market research schemes, or the manual/non-manual distinction. However, both the RG and market-research scales, which are intended as indicators of lifestyle and occupational skill, lack precision in both their definition of class categories and the principles for allocation to them (Bland, 1979; Marsh 1986; Marshall *et al.*, 1988), whereas the manual/non-manual distinction fails to identify important divisions within the manual and non-manual categories (Heath *et al.*, 1985; Evans

*et al.*, 1991). Other schemata have been developed on more systematic grounds, often from a Marxian perspective.[1] However, where Marxian empirical coding systems have been developed (e.g. Wright, 1985), they have not fared well in terms of their predictive efficacy and reliability of measurement when compared with Goldthorpe's schema (see Marshall *et al.*, 1988).

Goldthorpe's classification scheme, therefore, arguably remains the most significant conceptualization and operationalization of social class in current use.[2] The reasons for this impact are not difficult to ascertain. Not only have the writings of Goldthorpe and his colleagues provided a firm intellectual basis for the classes identified in the schema, but also the class categories have been shown to have considerable utility for understanding political attitudes and behaviour (Heath *et al.*, 1985; 1991; Marshall *et al.*, 1988; Evans *et al.*, 1991) and, most extensively, social mobility (see *inter alios* Goldthorpe, 1980; 1987; Goldthorpe and Payne, 1986; Erikson and Goldthorpe, 1992). By revealing significant features of the class structure that would have been obscured by other schemata, it has changed our understanding of the relationship between stratification and several important sociological variables.

Surprisingly, despite the increasing use of the schema, there is no research into its validity as a measure of the class characteristics of occupations. Given its wide-ranging impact, such a methodological lacuna is, potentially at least, highly problematic. In this paper, therefore, we present an initial empirical test of the schema's validity. First, we shall argue that a test of criterion-related validity, rather than construct validity, is the most appropriate way of assessing the validity of the schema. We then propose that the relevant criterion for assessing that validity involves measuring the class characteristics of occupations, and in particular, that it involves the measurement of those aspects of employment conditions which distinguish service and labour contracts. In the empirical analysis we then use the most comprehensive measures of employment conditions and occupational characteristics presently available

to test the ability of the schema to index Goldthorpe's concept of class.

## THE CHOICE OF VALIDITY TEST

The literature on validity assessment distinguishes between construct and criterion-related validity.[3] According to some authors (Cronbach and Meehl, 1955; Carmines and Zeller, 1979; Bohrnstedt, 1983), construct validity is the favoured mode of the social sciences; it involves assessing whether a measure of a concept predicts other variables in theoretically prescribed ways. Thus if our theory predicts that class is related to partisanship, then a test of construct validity would involve examining the associations between a class schema and voting behaviour. If the link is found to be strong, then the schema has some degree of validity. But what if there is only a weak association between the schema and partisanship, or none at all? In such circumstances we have to choose between at least three interpretations: first, it could be that the theory was wrong, and that class and partisanship are not related in the fashion we had supposed; second, the measurement of partisanship may itself be flawed; and finally, the schema may not be a valid measure of class. Clearly, tests of construct validity are dependent upon the presence of well-established theories about the relations between the construct being tested and the variables used to assess its validity.

Criterion-related validity, on the other hand, requires that the concept of interest is specified and measured directly. It is dependent, not on a theory linking the concept to other variables, but on the measurement of an outcome or characteristic that represents directly (or as directly as possible) the concept we are trying to index through indirect means. This means that a test of the criterion-related validity of the Goldthorpe class schema requires the measurement of the class characteristics specified in his theoretical writings. The schema is, after all, only a proxy for the underlying concept of social class, it does not directly index the characteristics identified as part of the concept of class. Therefore, if the schema fails to predict

characteristics which are direct indicators of the concept of class, its ability to measure class is called into question.

On the basis of this argument we suggest that it is preferable to think of non-occupational correlates of class as indicators of the *fruitfulness* of the schema for identifying important sociological relationships, but not as suitable tests of the *validity* of the schema. This implies that analyses such as that conducted by Savage (1991), which point to the Goldthorpe schema's failure to predict divisions in voting behaviour within classes and then argue that the schema lacks validity and requires modification, are ill-founded. As the schema does not claim to measure political characteristics, an assessment of its association with partisanship—although useful for indicating the schema's empirical fruitfulness in predicting other phenomena—is not indicative of how well it measures social class. This point is reinforced by research which has suggested that the relationship between class and party is contingent on a variety of conditioning factors, including the actions of parties and unions and the historical basis of the links between them (e.g. Lipset and Rokkan, 1967; Vanneman, 1980; Gallie, 1983; Wright, 1985; Vanneman and Cannon, 1987; Evans *et al.*, 1991; Heath *et al.*, 1991). Clearly, it would be unwise to use the strength of such a conditional association as even an indirect indicator of the schema's validity.

For these reasons we consider that although positions in the class structure may be more or less predictive of partisanship or other class-related variables, these variables—such as voting behaviour and, similarly, class identity, which is related to status, income, and other factors, as well as to class (see, for example, Hodge and Treiman, 1968; Vanneman and Pampel, 1977; Evans, 1992)—are not suitable criteria by which to assess the Goldthorpe schema's validity. A preferable test of validity is to assess whether the schema divides the occupational structure in such a way as to identify important cleavages in the job characteristics which are considered theoretically significant by Goldthorpe and his colleagues. The measurement of such characteristics and their association with the schema

provides a suitable test of validity precisely because they index directly the dimensions of class relations that are identified in Goldthorpe and his colleagues' conceptualization of the class structure.

## WHAT DOES THE GOLDTHORPE CLASS SCHEMA PURPORT TO MEASURE?

The most comprehensive statement of the theory underlying the schema is given in *The Constant Flux* (Erikson and Goldthorpe, 1992): 'The aim of the schema is to differentiate positions within *labour markets* and *production units* or, more specifically, one could say, to differentiate such positions in terms of the *employment relations* that they entail' (p. 37). The reference to *positions* within labour-markets and production units serves to emphasize that the schema is concerned with positions rather than individuals. This differs from earlier discussions of the schema, where the divisions between social classes were based upon the 'typical' work and market situations associated with occupations (i.e. Goldthorpe, 1980; 1987). Nevertheless, the allocation of individuals to locations in the schema are calculated in the same way as in the earlier works, using occupational categories derived from job descriptions and employment status (i.e. self-employed, employee, management).

As with many class schemata, as opposed to status scales, the Goldthorpe schema distinguishes between the self-employed and employees. This division is well-established in both Marxist and Weberian traditions of class analysis and will not be examined here. Of more interest are the distinctions made between classes within the category of employees, which are the most disputed aspects of the schema. Thus Erikson and Goldthorpe argue that 'in consequence of employer–employee relations being placed on quite heterogeneous principles, employees in fact occupy a range of different labour market and work situations, among which meaningful distinctions can and should be made in class terms' (p. 41). These 'meaningful distinctions' refer to differences in 'the labour contract' and 'the conditions of employment'

of employees (p. 41). In *The Constant Flux* the basis of these distinctions is elaborated upon in some detail

Employment relationships regulated by a labour contract entail a relatively short-term and specific exchange of money for effort. Employees supply more-or-less discrete amounts of labour, under the supervision of the employer or of the employer's agents, in return for wages which are calculated on a 'piece' or time basis. In contrast, employment relationships within a bureaucratic context involve a longer-term and generally more diffuse exchange. Employees render service to their employing organization in return for 'compensation' which takes the form not only of reward for work done, through a salary and various perquisites, but also comprises important *prospective* elements—for example, salary increments on an established scale, assurances of security both in employment and, through pensions rights, after retirement, and, above all, well-defined career opportunities. (pp. 41-2)

It should be noted that in his earlier writings Goldthorpe gives an expanded set of characteristics on which classes differ. Thus he argues that members of classes are comparable

on the one hand, in terms of their sources and levels of income, their degree of economic security and chances of economic advancement; and on the other, in their location within systems of authority and control governing the process of production in which they are engaged, and their degree of autonomy in performing their work-tasks and roles (Goldthorpe, 1980: 39).

Here, in addition to those characteristics listed in his more recent writings with Erikson, there is an explicit reference to class differences in work autonomy. Nevertheless, in *The Constant Flux* it is made clear that although autonomy, and authority, are correlated with the distinction between having a service relationship rather than a labour contract, they are not the theoretical principles on which the employee class divisions are based:

It is . . . the distinction between employees involved in a service relationship with their employer and those whose employment relationships are essentially regulated by a labour contract that underlies the way in which, within our class schema, different

employee classes have been delineated. (Erikson and Goldthorpe 1992: 42.)

This newer definition of the schema is both more precise and exclusive than the earlier description. It should be clear, therefore, that it differs from Wright's (1978; 1985) model of class, in which authority and job autonomy are key distinctions (see Erikson and Goldthorpe, 1992: 42): the organizing principle of the Goldthorpe schema is the nature of the employment relationship, rather than the content of work tasks and roles. And as the quotations from *The Constant Flux* illustrate, the key feature of this relationship is the way in which commitment is obtained from the work-force. Service occupations entail high levels of trust on the part of employers, whereas working-class occupations are more likely to have closely regulated work and payment arrangements. The mechanism of control by which loyalty is obtained from service-class employees is via the notion of advancement and perks. In particular, unless employees carry out their tasks adequately, they are unlikely to receive the long-term benefits of career advancement that characterizes service-class employment. In contrast, working-class employees receive payment for work done over a shorter time-span and are closely supervised to make sure that they carry out that work. In simple terms one could say that service-class employees are controlled by the 'carrot' of long-term benefits, and workers by the 'stick' of close regulation and the labour contract.[4]

In summary it can be seen that the distinguishing characteristics of Goldthorpe classes are their conditions of employment, degree of occupational security, and promotion prospects. These characteristics are, therefore, the main criteria for evaluating the validity of the schema. In addition, we would expect the degree of control over the labour process, the level of pay, and supervisory status to vary across classes. Although these are not given a central role in the theoretical discussions in *The Constant Flux*, Goldthorpe's earlier writings indicate that they are likely to be closely related to the distinction between service versus labour contract employment conditions. They can

therefore be thought of as secondary distinguishing characteristics of classes.

## ANALYSIS

### The survey

The data-set is the 1984 Essex 'class survey' of a random national sample of 1,770 respondents (see Marshall *et al.*, 1988 for further details). In the analysis presented here we focus on all employees who work for more than 30 hours a week ($n = 790–840$).[5] The inclusion of respondents who work for less than 30 hours a week, but more than 10 ($n = 150–160$) does not change the results to any substantial degree. Any differences of interest are referred to in the text.

### The measurement of social class

The basis of our analysis is the 11-class version of the Goldthorpe schema. However, as measures of the conditions of employment of the self-employed are not available in the Essex study, the analysis will examine only the employee classes; it does not include classes IV*a*, IV*b*, and IV*c*, or employers who are part of class I. Allocation to the class categories is based on respondents' own occupation. The breakdown of the schema into employer and employee classes is shown in Figure 1.

### The measurement of class characteristics

The measurement of class characteristics in a fashion suitable for the testing of the validity of the class schema involves obtaining indicators of different aspects of respondents' work and employment situations. The questions asked in the Essex class survey, although not unproblematic, cover a wide range of relevant issues. The items most relevant to the validation exercise can be grouped into three categories: prospects, employment conditions, and control over work tasks (see the Appendix for full descriptions of the questions).

Prospects are measured by two items enquiring about respondents' chances of promotion (within their present firm (Q44*a*) and externally (Q45*a*). Another question asks directly whether or not respondents are on a recognized career ladder (Q45*d*). The notion of job development is also indicated by whether respondents report improvement in the skills required in their jobs since starting them (Q54).
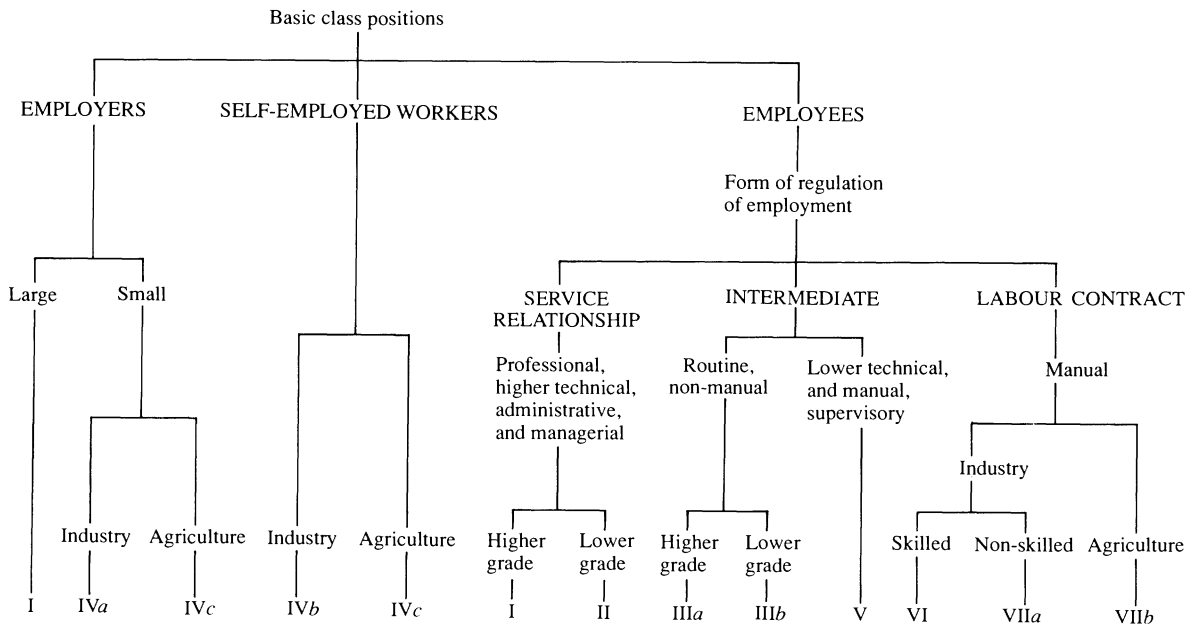


FIGURE 1 *The derivation of the class schema. (From Erikson & Goldthorpe, 1992: 36)*

Annual pay increments are another area in which we would expect there to be a clear difference between service and labour-contract employees. The question which addresses this issue in the Essex study is rather complex (Q51). The key distinction here is between those who do *not* receive an annual increment and all others. The latter category includes those receiving increments which are negotiated by unions or independently, formally or informally, at a fixed time of the year or at any time.

The next two questions incorporate elements of both prospects and terms of employment. They inquire as to *how* immediate (Q48) or long-term (Q50) pay rises are likely to be obtained. The key division here is between those who think they will have to work more hours to get more money and those who think promotion is the most likely way of improving their incomes. Service employment is likely to offer promotion as the route to improve pay, whereas working-class employees are likely to be tied to the labour contract with a direct connection between hours worked and payment and also little prospect of advancement and the rewards associated with it.

Another set of items assesses respondents' conditions of employment. Here, we focus on trust, which is a key element in labour-contract versus service-class conditions of employment, and is indicated by responses to the following items. The first question asks whether clocking-on is required, or whether employees are trusted to work their required period of time (Q47b). The second enquires about the ways in which payment is made, through a guaranteed wage, hourly rates, or piece-work etc. (Q46). The key division here is between hourly payment (or piece work and productivity payments), and a guaranteed basic salary. Finally, there is a question enquiring whether respondents are paid for overtime (Q47c)—such payment is indicative of a labour contract and is therefore associated with working-class status. This question underlines the difference between the theoretical approach focusing on conditions of employment adopted by Goldthorpe, and a view of class as simply a hierarchy of advantage: the consequences of a service relationship are not in all respects advantageous. Thus although it may be desirable to be paid extra for working overtime, it is not indicative of being 'middle class'.[6]

Finally, we shall examine in detail the degree of autonomy and control that employees have over their work tasks and conditions. For this we can use a battery of six related items (see also Marshall *et al.* 1988: 117–21). Although these questions were initially included in the survey to measure aspects of Wright's class schema and Braverman's de-skilling thesis (see Marshall *et al.* 1988: 116), they are also indirectly relevant to the differences specified between classes in the Goldthorpe schema. The items enquire whether respondents have: influence on the design of their job tasks (Q55a); control over the type of tasks undertaken from day to day (Q56a); control over their amount and pace of work (Q56b); control over when to start and finish work (Q56c); the freedom to reduce their pace of work if they want to (Q56e); and the freedom to initiate new tasks on the job (Q56g).

There are also questions on the secondary characteristics of level of pay and supervisory role. Level of pay is assessed straightforwardly via reports of gross annual salary (Q47d). Self-reported supervision (Q57) provides a way of checking the accuracy of the schema in classifying jobs in terms of their degree of authority. This question is not ideal, as it enquires about the *act* of supervising other employees, whereas the schema is concerned with the *status* of being a supervisor.[7] Neither the pay nor the supervision items are direct tests of the validity of the schema, but they do provide useful information about characteristics that are assumed to be correlated with the distinctions between types of employment relations. As we shall be examining quite a wide range of characteristics—employment conditions, prospects, autonomy, supervision, and pay—we shall use the terms occupational or job characteristics to refer to the full set of characteristics, reserving the term 'class characteristics' for those types of characteristics which, because of their emphasis on employment relations, are more central to the concept of class.

### The relationship between Goldthorpe classes and occupational characteristics

First we shall present the distributions of each

TABLE 1 *Occupational characteristics items by Goldthorpe classes (all figures are percentages)*

| | Goldthorpe Classes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | I | II | IIIa | IIIb | V | VI | VIIa | VIIb |
| **Characteristics** | | | | | | | | |
| Clocks on | 18 | 17 | 26 | 30 | 43 | 61 | 58 | 0 |
| Is on hourly rate | 0 | 11 | 13 | 22 | 29 | 58 | 56 | 67 |
| Is on basic salary | 79 | 71 | 72 | 61 | 48 | 21 | 18 | 0 |
| Is paid for overtime | 37 | 44 | 62 | 87 | 88 | 89 | 92 | 33 |
| No annual increments | 16 | 11 | 19 | 25 | 30 | 44 | 38 | 0 |
| **Internal promotion** | | | | | | | | |
| High chance | 24 | 30 | 14 | 17 | 24 | 9 | 8 | 0 |
| No chance | 28 | 26 | 34 | 48 | 30 | 47 | 56 | 83 |
| **External promotion** | | | | | | | | |
| High chance | 27 | 28 | 11 | 17 | 16 | 10 | 8 | 0 |
| No chance | 25 | 26 | 37 | 22 | 52 | 52 | 53 | 33 |
| **Immediate way to pay rise** | | | | | | | | |
| Through promotion | 35 | 31 | 24 | 26 | 23 | 9 | 9 | 0 |
| Working longer hours | 2 | 8 | 8 | 17 | 16 | 31 | 39 | 50 |
| **Long-term way to pay rise** | | | | | | | | |
| Through promotion | 56 | 48 | 38 | 44 | 35 | 24 | 15 | 0 |
| Working longer hours | 0 | 1 | 6 | 4 | 10 | 16 | 13 | 50 |
| Skill has increased | 82 | 83 | 68 | 50 | 72 | 59 | 43 | 84 |
| Skill has decreased | 1 | 1 | 3 | 5 | 4 | 6 | 6 | 0 |
| On career ladder | 79 | 74 | 50 | 27 | 70 | 36 | 22 | 60 |
| Designs own work | 76 | 69 | 33 | 29 | 52 | 21 | 17 | 33 |
| Decides day-to-day tasks | 90 | 76 | 47 | 50 | 50 | 21 | 18 | 67 |
| Decides amount and pace | 93 | 86 | 75 | 58 | 69 | 53 | 48 | 100 |
| Decides start and finish | 72 | 43 | 36 | 0 | 27 | 13 | 17 | 67 |
| Can reduce work pace | 74 | 67 | 64 | 46 | 57 | 56 | 52 | 50 |
| Can initiate new tasks | 77 | 73 | 43 | 54 | 55 | 24 | 23 | 50 |
| Supervises others | 83 | 71 | 19 | 13 | 82 | 5 | 7 | 33 |
| Gross income in £1000s[a] | 11.4 | 7.8 | 4.7 | 3.7 | 6.5 | 5.3 | 4.8 | 6.8 |
| Approx. N = | (80) | (180) | (150) | (24) | (80) | (140) | (180) | (6) |

[a]These figures are computed by taking, where possible, the mid-point of 11 income categories.
Note: Fuller descriptions of the items are given in the appendix.

item by the eight employee classes in the 11-class version of the schema. The distributions of all the items are presented in Table 1. The first few items in the table refer to employment conditions. As one would expect, clocking-on is a characteristic associated distinctively with manual work: even class IIIb respondents are very much like the service class in this respect when compared with classes V to VII. However, they are more like the manual workers in receiving payment for overtime (as is class V), whereas class IIIa is clearly intermediate in this respect. The method of payment (Q46) has a gentle gradient from class I who tend to receive basic salaries with little performance element and no hourly paid employees (or those whose pay is purely piece-work or performance-related), to those in classes VI and VII who are predominantly hourly paid, with only a fifth receiving a guaranteed basic wage. Classes III (especially IIIb) and V form an intermediate category.

This service/intermediate/working class pattern is also re-iterated in responses to the items on prospects, which form a second key element of Goldthorpe's schema. Respondents'

estimates of promotion chances are less clearly divided on class grounds than were their responses to the employment conditions items. Nevertheless, they still vary by class, with the only deviations from a gradual slope being class V, which reports higher chances of internal (but not external) promotion than do classes IIIa, or IIIb. A similar pattern also emerges for the items on the most likely way for respondents to increase their income. Once again there is a clear slope from class I down to class VIIa, only class IIIb breaks the pattern by having less opportunity for promotion as a route to economic advancement than the other intermediate classes. Also, the item focusing on short-term economic advancement produces clearer class differences than does the item focusing on the long term.

The four items on prospects considered so far have an explicitly future orientation. In contrast the question on skills looks at the past. For this item we find a tripartite division, with class IIIb clearly more similar to the working class. The career ladder question is different again, in that it refers to the structure of advancement, which presumably is a reflection of organizational rules. It is likely, therefore, that responses to this item are less subjective than the other prospects questions. Interestingly, we find that a large proportion of class V report being on a recognized career ladder, whereas class IIIb responses are similar to those in class VII and are noticeably lower than class IIIa. The class differences in responses to this question are thus a little larger than is the case with the other prospects items.

It would have been reasonable to expect the question on annual increments to be a key item, as it links elements of both future economic advancement (Q48 and Q50) and method of payment (Q46). However, the levels of working-class employees who report receiving annual increments is surprisingly high, which suggests that they interpreted the term 'increments' in a different manner to that intended by Marshall *et al.* The possibility that there may have been some misunderstanding when answering this question is also suggested by the finding (see the next section) that responses to it fail to correlate with any of the main dimensions of class

characteristics, whereas almost all of the other items are related to one or more of those dimensions. Despite these problems there are predictable, if relatively weak, class differences in the tendency to report having no facility for obtaining increments.

The next six items all enquire about some feature of respondents' control over their work conditions. The class distribution of responses to all these items conforms reasonably closely to the service/intermediate/working class hierarchy. The most notable deviations from this pattern are due to IIIb displaying a level of autonomy similar to the working class (Q56b, Q56c, Q56e), and class V displaying a noticeably higher level of autonomy than class III (Q55a). The one question on which class I is dramatically different from the others, is the item on whether respondents have a choice of when to start and finish work. For most items in the survey classes I and II are not distinct.

Finally, self-reported supervisory roles are strongly associated with membership of classes I, II, and V. The responses are thus consistent with the rationale underlying the construction of those classes, all of which have many occupations which have a supervisory status.[8] There are also clear differences in levels of pay between classes: class I stands out as clearly the best paid, and classes V and VI report earning considerably more than lower non-manual grades. The lowest pay of all is received by class IIIb, which is made up almost completely of women, many of whom work relatively short hours even when in full-time employment. Class VIIb respondents receive extremely high levels of pay, and they are also rather surprisingly advantaged in many aspects of their employment conditions. However, with only six respondents in this class there is little we can say about this peculiarity. Consequently, for the rest of the paper we shall pay little attention to class VIIb.

From this preliminary analysis it is clear that there are substantial and interpretable class differences in responses to almost all of the individual job characteristics items. Nevertheless, from such a large array of data we do not obtain a clear view of the general pattern of association between classes and class

characteristics. We can, however, use a discriminant functions analysis to summarize the association between the class schema and the class characteristics. This calculates the canonical correlation between the class characteristics and the Goldthorpe classes. It allows us to assess the dimensionality of the association, the most discriminating predictor variables (the characteristics), and the ordering of the classes.

Table 2 shows that there is one main dimension of association which accounts for 81 per cent of the shared variance between the class characteristics and the schema. Most class characteristics are reasonably highly correlated (in the expected direction) with this dimension. Moreover, the classes are ordered linearly from

TABLE 2 *Discriminant functions analysis of the class characteristics items*

|  | Correlations with 1st canonical variate |
| --- | --- |
| Clocks on | .35 |
| Is paid for overtime | .43 |
| Hourly rate or basic wage | .55 |
| No annual increments | .27 |
| Internal promotion | .22 |
| External promotion | .23 |
| Immediate way to pay rise | .33 |
| Long-term way to pay rise | .29 |
| Skill changes | .25 |
| On career ladder | .37 |
| Designs own work | .40 |
| Decides day-to-day tasks | .52 |
| Decides amount and pace | .34 |
| Decides start and finish | .33 |
| Can reduce work pace | .12 |
| Can initiate new tasks | .40 |
| Canonical correlation | .76 |
| % variance explained | 81.3 |

| | Group Centroids | |
| --- | --- | --- |
| Class I | 1.71 | (75) |
| Class II | 1.23 | (161) |
| Class IIIa | .41 | (132) |
| Class IIIb | .33 | (18) |
| Class V | .11 | (10) |
| Class VI | − 1.23 | (126) |
| Class VIIa | − 1.41 | (164) |
| Class VIIb | .82 | (4) |

class I through VIIa, and cluster into a clear service/intermediate/working class hierarchy of class characteristics. The canonical correlation between the items and the schema is .76, which is a reasonably high 'coefficient of validity' (Carmines and Zeller, 1979).

*The structure of occupational characteristics*
The analysis so far has described patterns of association between specific class characteristics and Goldthorpe classes. However, it is also important to examine the pattern of associations between classes and the *types* of class characteristic—prospects, employment conditions, and autonomy—identified in *The Constant Flux* and elsewhere. The different types of class characteristic vary in their degree of centrality to the concept (for example, employment conditions are more central than autonomy). It is desirable therefore to assess their relations with the class schema separately.

First, however, we need to examine the structure of responses to the class characteristics items. So far we have divided the items on *a priori* grounds. Nevertheless, there is no necessary reason why they should be structured in the manner we have assumed. For example, responses to questions about how respondents think they are likely to achieve higher salaries (Q48, Q50) may be associated with answers about promotion opportunities (Q44, Q45a), or with those concerning conditions of employment and modes of payment, such as piecework versus a basic-rate salary (Q46). Also, of course, they may be equally strongly (or weakly) associated with both. It is therefore better to assess the structure of the items empirically. To do this we need to analyse the structure of responses to the items to see if it contains distinct dimensions and to see if our *a priori* categorization corresponds to the actual pattern of associations.

If there is a relationship between the items it could take the form of either a uni-dimensional or a multi-dimensional structure. Thus there may be a general dimension underlying all of these responses or there may be distinct clusters of related job characteristics. The distinction between a uni-dimensional and multi-dimensional structure is important, because if

TABLE 3 *Principal components analysis of the class characteristics items*

| | Dimensions | | |
|---|---|---|---|
| | 1st | 2nd | 3rd |
| Clocks on | 04 | 15 | **67** |
| Is paid for overtime | 05 | 16 | **72** |
| Hourly rate or basic wage | 23 | 06 | **63** |
| No annual increments | 21 | 28 | 30 |
| Internal promotion | **78** | 13 | −05 |
| External promotion | **56** | 19 | −02 |
| Immediate way to pay rise | **65** | −08 | 38 |
| Long-term way to pay rise | **74** | 01 | 20 |
| Skill changes | 25 | 26 | 08 |
| On career ladder | **57** | 21 | 14 |
| Designs own work | 14 | **52** | 43 |
| Decides day-to-day tasks | 07 | **61** | 43 |
| Decides amount and pace | 07 | **71** | 08 |
| Decides start and finish | 08 | **51** | 22 |
| Can reduce work pace | 15 | **63** | −17 |
| Can initiate new tasks | 12 | **55** | 35 |
| Eigenvalues | 4.20 | 1.68 | 1.23 |
| % variance explained | 26.3 | 10.5 | 7.7 |

Largest item loadings are shown in bold.

there are distinct dimensions, then we may find that classes differ on some but not on others, or that the ranking of the classes varies across them. As a consequence, any class hierarchy may also be multi-dimensional. If the class characteristics have a multi-dimensional structure then classes may not be easily ranked, whereas this is more likely to be the case if the structure is uni-dimensional.

A check on the structure of the characteristics is provided by conducting a principal-components analysis. This allows the dimensionality of responses to the questions to be revealed empirically. The principal components analysis indicates that only 26 per cent of the variance in the items is accounted for by the first dimension, which indicates that the structure is multi-dimensional. Table 3 shows the loadings on the three dimensions (rotated to maximize distinctiveness) extracted from the analysis using the conventional cut-off point of an eigenvalue equal to or greater than 1.0.

From the table we can see that most items load moderately strongly on to the first (unrotated) principal component. This indicates that there is a main dimension of responses to the job characteristics items. Nevertheless, the rotated factors from the multi-dimensional solution indicate that there are three distinguishable and meaningful sub-areas: (*a*) job control and autonomy; (*b*) career prospects; and (*c*) service versus labour contract. The only items that fail to load clearly on to a dimension are the questions on annual increments and skills. Given the doubts already expressed regarding the increments item (see above), and the rather different focus of the skills item from the other questions, we did not include either item in further analyses.

We next constructed Likert scales of 'autonomy', 'prospects', and 'employment conditions', using the items which loaded clearly on to the three dimensions in the principal components analysis (the coefficients of these items are in bold type).[9] The average inter-item correlations are very similar for each of the scales and are moderately high at approximately .30. The reliability of the scales is estimated by calculating Cronbach's Alpha coefficients of their internal consistency. The reliabilities of the six-item autonomy and five-item prospects scales are adequate (both have a Cronbach's Alpha of .73). However, the employment conditions scale has a reliability of only .60. This is not surprising, given that it consists of only three items. However, this low reliability needs to be taken into account when interpreting the results obtained with this scale.[10]

The correlations between each of the scales, and between them and levels of pay and supervision are shown in Table 4. As would be expected both from *a priori* considerations and the principal components analysis, there are moderately strong associations between different types of job characteristics including levels of pay and supervision. The links between employment conditions and pay are a little weaker than the other associations, but these differences are not extreme. The scales thus appear to form distinct, but related types of class characteristic. The importance of the distinctions between the different types of characteristics will be illustrated in some of the following analyses, where they are shown to have different patterns of association with other variables.

TABLE 4  *Correlations between types of occupational characteristics*

|  | Employment Conditions | Prospects | Autonomy | Pay | Supervision |
|---|---|---|---|---|---|
| Mean score[a] | 3.12 | 8.36 | 2.94 | 4.63 | 0.37 |
| s.d. | (1.38) | (2.17) | (1.9) | (2.12) | (0.48) |
| Employment conditions |  | .34 | .44 | .26 | .38 |
| Prospects |  |  | .34 | .25 | .34 |
| Autonomy |  |  |  | .40 | .38 |
| Pay |  |  |  |  | .38 |
| (n = 777–844) |  |  |  |  |  |

[a]High scores equal a positive response; for the coding of pay see the Appendix.
Note: All associations are significant at $p < .001$ or below.

## The relationship between class and types of occupational characteristics

In this analysis we shall examine how well the class schema predicts the different types of occupational characteristics. We shall also consider the effects of other social characteristics: age, education, and sex. First, we shall assess the overall association between the schema, the socio-demographic characteristics, and the dependent variables, then we shall focus on differences between particular classes.

Given the rationale behind the schema, class should be most strongly associated with the distinction between a service relationship versus a labour contract. Whereas we might also expect prospects to be associated with age (older respondents may have lower expectations of future advancement), or education (as an indicator of human capital and aspirations). From Table 5 we can see that the effect of class on prospects is not much stronger than that of age. Also, we can see that including age and the other variables in the model does not reduce the coefficients of the class dummy variables. Age and class are therefore distinct and unrelated influences on prospects. Interestingly, from a disaggregated analysis (not shown) we can see that age is closely related to perceived prospects, future opportunities, and routes of advancement and less strongly related to being on a career ladder. This appears to reflect, at least in part, a ceiling effect. Thus we find a stronger negative relationship between perceived chances of promotion and age than we do for the other items, and a weaker link with class. In contrast,

being on a career ladder is more strongly linked with class and only weakly negatively associated with age.

One problem with the prospects measures is that most of them are of a rather subjective nature and may reflect aspirations (and abilities) as well as conditions. Perhaps more important for Goldthorpe's own principles of classification, are the items which measure employment situation—clocking on, overtime payments, and the method of payment—which are relatively objective. Also, these are characteristics associated with *positions* rather than *individuals*. They are therefore somewhat better indicators of the conceptualization of class adopted by Goldthorpe and his colleagues. Here we find stronger effects of class and very little extra variance explained due to other factors. Moreover, we should remember that this dimension has only a low reliability, if we were to correct for this weakness of measurement, the association with class would be considerably increased.

The autonomy index is not as strongly associated with class as is the employment conditions index, but it is still substantially related to it, and there is little extra variance explained from other items. We should note, however, that the autonomy index is a larger and more reliable scale than the employment situation index and is less affected by error. Its true association with class, therefore, is likely to be considerably lower than that of employment situation. We conclude from this that the most substantial effects of class are on employment conditions. It appears that these

TABLE 5    *Regression models predicting Employment Conditions, Prospects, and Autonomy*

| | Class only | | | | Class and demographics | | | |
|---|---|---|---|---|---|---|---|---|
| | B | SE B | Beta | T | B | SE B | Beta | T |
| **A. Employment Conditions** | | | | | | | | |
| Class I | 1.539 | (.095) | .508 | 16.1 | 1.295 | (.101) | .427 | 12.72 |
| Class II | 1.452 | (.081) | .597 | 17.7 | 1.252 | (.087) | .515 | 14.30 |
| Class IIIa | 1.268 | (.087) | .473 | 14.4 | 1.222 | (.094) | .456 | 12.99 |
| Class IIIb | .893 | (.173) | .143 | 5.1 | .874 | (.177) | .140 | 4.91 |
| Class V | .640 | (.105) | .185 | 6.0 | .631 | (.103) | .182 | 6.10 |
| Class VI | .087 | (.088) | .032 | .9 | 1.081 | (.086) | .030 | .94 |
| Class VIIb | .731 | (.331) | .059 | 2.2 | .726 | (.323) | .059 | 2.24 |
| Age | | | | | .051 | (.027) | .053 | 1.86 |
| Degree | | | | | .479 | (.104) | .145 | 4.58 |
| Sex | | | | | .009 | (.063) | .004 | .15 |
| Education | | | | | .072 | (.032) | .076 | 2.21 |
| (constant) | −.818 | .058 | | −14.0 | −1.066 | (.117) | | −9.06 |
| R Square | .413 | | | | .442 | | | |
| N = 836 | | | | | | | | |
| **B. Prospects** | | | | | | | | |
| Class I | 1.176 | (.112) | .388 | 10.41 | 1.136 | (.109) | .375 | 10.37 |
| Class II | 1.185 | (.096) | .487 | 12.22 | 1.151 | (.094) | .473 | 12.22 |
| Class IIIa | .742 | (.103) | .277 | 7.17 | .760 | (.101) | .284 | 7.51 |
| Class IIIb | .608 | (.204) | .097 | 2.96 | .484 | (.191) | .078 | 2.53 |
| Class V | .801 | (.124) | .231 | 6.42 | .880 | (.111) | .254 | 7.91 |
| Class VI | .202 | (.104) | .074 | 1.93 | .155 | (.093) | .057 | 1.66 |
| Class VIIb | .138 | (.391) | −.011 | −.35 | −.016 | (.348) | −.001 | −.04 |
| Age | | | | | −.359 | (.029) | −.372 | −11.99 |
| Degree | | | | | .141 | (.112) | .043 | 1.26 |
| Sex | | | | | −.302 | (.068) | −.142 | −4.42 |
| Education | | | | | .071 | (.035) | .075 | 2.02 |
| (constant) | −.647 | (.068) | | −9.46 | −.263 | (.126) | | 2.08 |
| R Square | .223 | | | | .389 | | | |
| N = 791 | | | | | | | | |
| **C. Autonomy** | | | | | | | | |
| Class I | 1.567 | (.101) | .517 | 15.46 | 1.448 | (.109) | .478 | 13.26 |
| Class II | 1.350 | (.086) | .555 | 15.52 | 1.302 | (.093) | .535 | 13.87 |
| Class IIIa | .760 | (.092) | .284 | 8.20 | .884 | (.100) | .330 | 8.77 |
| Class IIIb | .428 | (.183) | .069 | 2.34 | .627 | (.190) | .101 | 3.29 |
| Class V | .814 | (.111) | .235 | 7.28 | .789 | (.110) | .228 | 7.11 |
| Class VI | .167 | (.093) | .061 | 1.79 | .153 | (.092) | .056 | 1.65 |
| Class VIIb | 1.129 | (.351) | .091 | 3.21 | 1.112 | (.347) | .090 | 3.20 |
| Age | | | | | .031 | (.029) | (.032) | 1.05 |
| Degree | | | | | .365 | (.112) | .111 | 3.25 |
| Sex | | | | | −.218 | (.068) | −.102 | −3.19 |
| Education | | | | | −.007 | (.035) | −.008 | −.22 |
| (constant) | −.733 | .061 | | −11.90 | −.763 | (.126) | | −6.05 |
| R Square | .335 | | | | .354 | | | |
| N = 841 | | | | | | | | |

Notes: To allow comparison of coefficients between models the dependent variables have been standardized. As class sizes vary considerably the unstandardized regression coefficients are to be preferred. Coding of the variables: sex (male = 0, female = 1); age (age in years); education (years of schooling recoded to 1–7); degree (higher educational qualifications i.e. degree, teacher-training qualification = 1, otherwise 0). Further details of the questions used to elicit information on respondents' characteristics are to be found on pages 295–304 of Marshall *et al.* (1988).

TABLE 6 *Regression models predicting Pay and Supervision*

| | Class only | | | | Class and demographics | | | |
|---|---|---|---|---|---|---|---|---|
| | B | SE B | Beta | T | B | SE B | Beta | T |
| **A. Pay** | | | | | | | | |
| Class I | 3.105 | (.226) | .483 | 13.70 | 2.518 | (.215) | .392 | 11.69 |
| Class II | 2.052 | (.194) | .398 | 10.55 | 1.971 | (.185) | .382 | 10.65 |
| Class IIIa | − .093 | (.207) | − .016 | − .45 | .814 | (.198) | .143 | 4.09 |
| Class IIIb | − 1.290 | (.410) | − .098 | − 3.14 | .237 | (.375) | .018 | .95 |
| Class V | 1.324 | (.250) | .180 | 5.29 | 1.082 | (.218) | .147 | 4.95 |
| Class VI | .596 | (.209) | .103 | 2.84 | .511 | (.183) | .088 | 2.79 |
| Class VIIb | 1.575 | (.785) | .060 | 2.00 | 1.389 | (.684) | .053 | 2.03 |
| Age | | | | | .375 | (.058) | .183 | 6.37 |
| Degree | | | | | 1.262 | (.221) | .181 | 5.70 |
| Sex | | | | | − 1.646 | (.134) | − .365 | − 12.23 |
| Education | | | | | .030 | (.069) | .015 | .44 |
| (constant) | 3.626 | (.137) | | 26.44 | 2.919 | (.248) | | 11.76 |
| R Square | .306 | | | | .476 | | | |
| N = 858 | | | | | | | | |
| **B. Supervision** | | | | | | | | |
| Class I | .755 | (.042) | .515 | 17.80 | .795 | (.046) | .543 | 17.23 |
| Class II | .685 | (.036) | .583 | 18.84 | .724 | (.039) | .616 | 18.26 |
| Class IIIa | .160 | (.038) | .124 | 4.14 | .182 | (.042) | .140 | 4.27 |
| Class IIIb | .099 | (.076) | .033 | 1.29 | .126 | (.080) | .042 | 1.56 |
| Class V | .811 | (.046) | .485 | 17.33 | .808 | (.046) | .484 | 17.23 |
| Class VI | .020 | (.039) | .015 | .50 | .020 | (.039) | .015 | .51 |
| Class VIIb | .313 | (.147) | − .052 | 2.12 | .310 | (.146) | .052 | 2.11 |
| Age | | | | | − .001 | (.012) | − .001 | − .04 |
| Degree | | | | | − .087 | (.047) | − .055 | 1.85 |
| Sex | | | | | − .023 | (.028) | − .023 | − .82 |
| Education | | | | | − .012 | (.014) | − .027 | − .83 |
| (constant) | .019 | (.025) | | .75 | .044 | (.053) | | .84 |
| R Square | .496 | | | | .491 | | | |
| N = 858 | | | | | | | | |

contractual arrangements, with their emphasis on a service or labour contract, divide classes more than the other characteristics do.

From previous research we would also expect class to predict income and supervisory role reasonably strongly. From the models in Table 6 we can see that this is the case. Self-reported supervisory role is especially strongly predicted by class and little else, which is not surprising given the explicit use of supervisory status in distinguishing between classes in the schema.[11] Levels of pay, although related to class, are also strongly predicted by sex, and more weakly by age and education.

Now we turn to an examination of particular class boundaries. From the regression co-efficients in Tables 5 and 6 we can see that class IIIa is similar to the working class (classes VI and VII) in level of pay, but it is far more like the service class in conditions of employment than are any of the manual classes. In terms of prospects and autonomy class IIIa is similar to class V and lies in between the service class and the working class. We can see, therefore, that on the theoretically most important dimensions of job characteristics the routine non-manual workers are clearly different from the working class. Class IIIb is somewhat less advantaged in all of these respects, but follows a similar pattern to class IIIa, in having employment conditions that are more like the service class than are those of classes VI and VIIa. With

regard to level of pay, we should note that class III*a* and III*b* respondents work fewer hours (average 38.5) for their wages than do manual or other workers, who report working an average of between 42 and 46 hours per week. These differences in hours worked are in part due to the large numbers of women (72 per cent) in class III*a* and III*b* (women in all classes tend to work fewer hours than men). As can be seen from the models in the lower half of Table 6, when sex is controlled for (as well as age and education), class III*a* moves to an intermediate position with regard to income and class III*b* is no less well-paid than is class VII*a*.

There is no significant difference between the two service classes: classes I and II tend to be similar across all areas of occupational characteristics except pay. The slightly higher (but non-significant) rating of prospects by class II is perhaps surprising. However, we should remember that promotion chances could be lower for class I respondents, precisely because they have already got to the top of the career ladder. Certainly, in a follow-up question (Q44*b*), 61 per cent of those who reported having no chance of promotion in class I could not progress any further due to being at 'the top of the ladder', whereas this applied to only 48 per cent of class II. Ceiling effects probably account for the similar or slightly higher expectation of promotion by class II respondents.

There are clear differences between the foremen and technicians and the other two manual classes. However, as with the service classes, there is a lack of clear distinctiveness between classes VI and VII in all areas of occupational characteristics. Level of pay is the only difference between them. Moreover, the notion of a ceiling effect does not appear to account for the lack of a significant distinctiveness in the perceived promotion prospects of skilled workers and semi-skilled workers. The former (46 per cent) report no more ceiling effects than do the latter (47 per cent). Finally, we should note that even for those characteristics (autonomy and employment conditions) in which ceiling effects are less likely to invert the expected ranking, there is little or no difference between classes I and II or between classes VI and VII.

It appears, therefore, that pay is the only characteristic that differentiates classes within the service and working classes: it forms the most noticeable advantage of class I over class II, and a highly significant difference between class VI and class VII. Nevertheless, in the more recent versions of the theory underlying Goldthorpe's schema, level of pay is not a criterion on which classes are distinguished. The lack of theoretically important differences between classes I and II and between classes VI and VII provides some justification for aggregating these categories in the manner adopted by Heath and his colleagues (see Heath *et al.* 1985; 1991). Thus classes I and II can be combined to form a broad 'salariat' of managers, professionals, administrators, and semi-professionals, and classes VI and VII can form 'the working class' of skilled, semi-skilled, and unskilled manual workers.

The analysis of the relationship between the disaggregated Goldthorpe class schema and types of occupational characteristics shows, on the whole, the pattern of relationships we would expect to find. We shall now focus on the implications for the measurement of the underlying class concept of the allocation of sub-classes to higher order categories.

### The costs of aggregation

Does aggregation obscure important class divisions? This issue is especially important for the many analyses—such as those reported in *The Constant Flux*—in which the full 11-class schema cannot be measured. Clearly, it is useful to know whether these are undesirably crude versions of the 11-class schema as critics have suggested (see Hout and Hauser in this issue).

The most commonly used versions of the Goldthorpe schema are the seven-class schema used in cross-national analyses (see Erikson and Goldthorpe's paper in this issue), the seven-class version used in British mobility analyses, the five-class version used in British voting studies (see Heath *et al.* 1991), and the three-class version used when cases are limited (see, for example, Gallie and Vogler, 1990; Evans, forthcoming). Much of the aggregation from the 11-class schema to the condensed versions involves the combining of the self-employed

classes and therefore does not concern us. Even within just the employee classes, however, there are a diverse set of aggregations to consider.

In the British seven-class schema interest centres on the fate of class IIIb, which is allocated to either class III (e.g. Marshall *et al.*, 1988) or class VII (Gallie and Vogler, 1990),[12] and classes VIIa and VIIb, which are combined.[13] The five-class version keeps classes V and VI separate, but aggregates classes I and II, and classes VI and VII (Heath *et al.*, 1991). The three-class version collapses III and V (along with class IV) to form the intermediate class.

The cross-national versions of the schema involve somewhat different strategies of aggregation. The seven-class version used by Erikson and Goldthorpe involves the aggregation of classes IIIa and IIIb, classes I and II, and classes V and VI. Their five-class version further combines classes I and II with class III. The three-class version simply distinguishes between non-manual (I, II, III) versus manual (V, VI, VII) employees, with agricultural workers forming a separate, but trivially small class.

The first step in the aggregation process, for both the British and cross-national versions of the seven-class schema, is the placing of class IIIb in either class III, or class VII. If we refer back to Table 1 we can see that on some of the individual items class IIIb is closer to class IIIa, and on others it is closer to class VIIa. However, if we examine the dimensions of class characteristics we find that including class IIIb with class VII results in a slightly weaker link between the Goldthorpe class schema and two of the dimensions (employment situation and autonomy), and no difference with regard to autonomy, pay, and supervision (these results are shown in Table 8). Nevertheless, the differences in the strengths of association between class and job characteristics in the models are very small.

We should not forget, however, that class IIIb is composed almost entirely of women (there is only one IIIb man in our data). Therefore, to avoid comparing women IIIb respondents with male respondents in classes IIIa and VII, it makes sense to examine the effects of allocation to class III or VII for women alone.[14] The analysis with just women respondents produces more clear-cut findings in that class IIIb becomes more like class IIIa and less like class VII. Nevertheless, the position of IIIb respondents *vis-à-vis* classes IIIa and VII varies with the type of occupational characteristics under consideration. Thus, although levels of pay in class IIIb are lower than in either class VII or class IIIa, levels of reported job

TABLE 7  *The effects of allocating class IIIb respondents to class III or class VII on the association between class and occupational characteristics (women only[a]): means of scales and single items by class*

|  | Employment conditions | Prospects | Autonomy | Pay | Supervision | (N) |
|---|---|---|---|---|---|---|
| Class I | 4.0 | 9.7 | 4.6 | 7.8 | .71 | (17) |
| Class II | 3.8 | 9.3 | 3.8 | 5.6 | .69 | (69) |
| Class IIIa | 3.8 | 8.4 | 2.8 | 4.2 | .20 | (108) |
| Class IIIb | 3.2 | 8.1 | 2.4 | 3.6 | .13 | (23) |
| Class V | 2.9 | 8.3 | 3.5 | 3.7 | .70 | (10) |
| Class VI | 2.4 | 7.1 | 1.7 | 3.8 | .70 | (22) |
| Class VIIa | 2.1 | 6.4 | 1.3 | 3.8 | .05 | (38) |
| Variance explained by class |  |  |  |  |  |  |
| (i) Disaggregated schema | 29.3 | 23.5 | 24.5 | 25.0 | 33.7 |  |
| (ii) IIIb to III | 27.8 | 23.1 | 24.2 | 23.5 | 33.5 |  |
| (iii) IIIb to VII | 24.6 | 19.7 | 22.7 | 24.9 | 33.3 |  |
| (ii) minus (iii) | 3.2 | 3.4 | 1.5 | − 1.4 | 0.2 |  |

(n = 261–287)

[a]There was only one woman in class VIIb; this class was therefore excluded from the analysis.

autonomy fall between those classes, and both employment conditions and prospects are far more like class IIIa than class VII (see Table 7).[15] Given the importance of employment conditions and prospects to the distinctions drawn between classes in the Goldthorpe schema, it may therefore be preferable to place IIIb women in class III rather than class VII.[16]

Of course, because of the subjective nature of some of the items these conclusions are only suggestive, but our analysis suggests it may be worthwhile reconsidering the policy of treating class IIIb respondents—whether men or women—as working class. Consequently, for the next set of analyses we shall allocate all class IIIb respondents to class III. We should note, however, that regardless of which method of aggregation is adopted, the explained variance in job characteristics lost by aggregating classes IIIa and IIIb is relatively trivial. Therefore the choice of aggregation does not seriously restrict the validity of the schema as it stands at present.

Now we shall consider the loss of predictive power that results from combining classes to make aggregated versions of the schema.[17] Table 8 shows that for many of these condensed forms of the schema there is little loss of predictive power. The British aggregation procedures are especially effective at minimizing the reduction in explained variance in job characteristics. Only in the three-class version is the explained variance reduced by a substantial amount, and then it is only for pay and supervisory role. For the cross-national versions there is clearly a more substantial decline in the prediction of several characteristics, especially supervisory role and pay. Even here, however, there is far less decline in the theoretically more central characteristics. Indeed, the association between class and employment conditions is relatively unaffected by any of the aggregation strategies. These findings highlight the importance of distinguishing empirically between the different types of occupational and class characteristics. The associations between the Goldthorpe classes and the core class characteristics certainly appear to be robust in even the most aggregated versions of the schema.

DISCUSSION

## Summary

We have found that class membership strongly predicts employment and payment conditions, future prospects, authority roles, and control

TABLE 8    *The effects of different versions of the class schema on occupational characteristics: explained variance ($R^2$)*
*in occupational characteristics*[a]

| Versions of the schema | Employment Conditions | Prospects | Autonomy | Pay | Supervision |
|---|---|---|---|---|---|
| Full 11-class schema | .413 | .223 | .335 | .306 | .492 |
| British 7-class IIIb = III | .407 | .223 | .325 | .295 | .489 |
| | (.02) | (.00) | (.03) | (.04) | (.01) |
| British 7-class IIIb = VII | .391 | .214 | .324 | .293 | .488 |
| | (.05) | (.04) | (.03) | (.04) | (.01) |
| British 5-class | .394 | .213 | .302 | .249 | .471 |
| | (.05) | (.04) | (.10) | (.19) | (.04) |
| British 3-class | .373 | .213 | .301 | .214 | .356 |
| | (.10) | (.04) | (.10) | (.30) | (.28) |
| Cross-nat. 7-class | .379 | .196 | .286 | .249 | .317 |
| | (.08) | (.12) | (.15) | (.19) | (.36) |
| Cross-nat. 5-class | .360 | .163 | .210 | .047 | .141 |
| | (.13) | (.27) | (.37) | (.85) | (.71) |
| Cross-nat. 3-class | .353 | .146 | .197 | .036 | .103 |
| | (.14) | (.35) | (.41) | (.88) | (.79) |

[a]Figures in parentheses are the proportion of the $R^2$ of the full model lost by aggregation.

over the labour process. Moreover, the substantial association between class and indicators of a service relationship versus a labour contract confirms empirically the main distinction embodied in the schema. The only noticeable deviation from the expected pattern is the failure to find substantial differences between the class characteristics of skilled workers (class VI) and semi- and unskilled workers (class VII), and between classes I and II. This finding supports the strategy of aggregating those pairs of classes to form the 'salariat' and the 'working class'.

Overall our analysis indicates that divisions between employee classes in the Goldthorpe schema are hierarchical, with a service class, an intermediate class of foremen and technicians, and routine non-manual workers, and a working class of skilled, semi-skilled, and unskilled manual employees. However, a degree of complexity is added to this picture by the finding that the structure of the job characteristics items is multi-dimensional. In particular, we have found that the intermediate classes do not have a constant location across the different dimensions: classes III and V differ considerably in their employment conditions, supervisory roles, and levels of pay. This multi-dimensionality has implications for the debate about the supposed proletarianization of routine non-manual workers. According to our analysis, claims that class III workers are now working class (e.g. Crompton and Jones, 1984) are inaccurate, because even though some of their occupational characteristics are similar to those of classes VI and VII, their employment conditions—which is the most theoretically relevant dimension of occupational characteristics—clearly distinguish them from the manual working classes.

As well as describing the general pattern of relationships between class and occupational characteristics, our analysis also addressed certain methodological issues. An examination of the job characteristics associated with class IIIb indicated that they were more similar to class IIIa than to class VIIa. Therefore, although the confident allocation of IIIb awaits a more precise recoding of class IIIb occupations, there appear to be good reasons for including this category in class III rather than class VII. We

should note, however, that the allocation of IIIb respondents to class III or class VII makes only a small amount of difference to the explained variance in the models predicting job characteristics.

It was also shown that the various aggregation procedures adopted for British and cross-national research do not greatly reduce the validity of the shorter versions of the schema. Thus although pay and supervisory role were affected by some of the aggregation procedures adopted, for example, in *The Constant Flux*, the core characteristics, particularly employment conditions, were not. The aggregation strategy used in British research was particularly effective at minimizing the loss of discriminating power. The findings thus provide strong support for the continued use of those procedures. However, the systematic validation of the schema for comparative analyses requires far wider databases than the rather small British sample at our disposal. The findings in that respect can only be considered a preliminary stage in an assessment of the schema's usefulness.

*Further considerations on the question of validity*

We now consider two critical questions raised by the findings. First, that the explained variance in the job characteristics items is not high enough to justify our conclusion that the schema has validity; and second, that in order to increase the validity of the schema it would be desirable to further disaggregate even the original 11-class version of the schema.

We have two arguments in support of our conclusion that the strength of the association between the schema and the job characteristics variables is sufficiently high for the schema to be considered valid. The first point is that all the measures of job characteristics are to some degree unreliable. In particular, we should remember that the employment conditions index has an especially low level of reliability. If we were to correct for attenuation due to measurement error its effect would be far stronger.[18] However, in this paper we have chosen not to adjust our estimates of the associations due to lack of reliability, for we do not know if the poor internal consistency of the

scale is due to error or to real differences in what our items are measuring. We consider it is safer, at this juncture, to treat the coefficients obtained with the uncorrected scales as conservative, lower-bound estimates of the 'true' relationship.

The second point concerns the level of aggregation at which the association between the schema and the job characteristics is estimated. Although we have examined how well the class schema accounts for *individual* variation in class-related characteristics, of perhaps greater relevance to its validity is how well it accounts for the association between occupational categories (such as occupational unit groups) and those characteristics. After all, the errors resulting from lower-order aggregations of particular jobs into occupational categories are not specific to the Goldthorpe schema: they are limitations of all occupationally-based schemes which use official categories as a foundation of further aggregation. Thus an appropriate test of the schema's validity would be to examine whether it is an adequate summary measure of the distribution of characteristics at the level of the smallest practicable occupational unit. At the present time, the data to enable this analysis is in the process of being collected.

The arguments which counter the first criticism also effectively answer the question concerning the disaggregation of the schema. If the validity of the schema is adequate then further disaggregation of the full 11-class version of the schema would be pointless. This fits with the observation (in Table 8) that moving from the seven-class version to the 11-class version only increases the discriminating power of the schema to a very small degree. Thus, although we cannot be sure that increasing the number of categories in the schema would fail to increase its predictive efficacy, we can be reasonably confident that any such increment would be small. We would therefore add little to the schema's predictive power, whilst considerably increasing the degrees of freedom used by the measure.

*Future directions*
This validation exercise is of only an exploratory and limited character. This is a consequence of both the paucity of relevant methodological and

theoretical development in the area and of the weaknesses of the indicators of employment relations at our disposal. An important goal for future work is to increase the validity of the criterion variables by improving the items used to measure class characteristics. In particular, the number of employment-condition items needs to be increased and the wording of certain items clarified. We have already mentioned the need for items on payment when off sick and on pension schemes, but it would also be valuable to have items which ask about physical conditions, such as noise, dirt, cold, physical exhaustion, and industrially related illness. It could also be informative to measure the occupational characteristics of the self-employed.

Even with the limited data available at the present time there are several developments which can be made to increase knowledge of the schema's validity. One strategy is to compare the predictive power of the schema with that of other measures of social class. Clearly, this is not a test of the validity of these other measures as they do not claim to index the same job characteristics as does Goldthorpe's schema. However, we could discover whether the latter is superior in its ability to predict such characteristics. If it is a valid measure of class, as defined by Goldthorpe, it should have more predictive power than other measures. This test could be expanded to include non-class influences on job conditions, in particular, the public–private sector distinction, size of firm, and type of industry, i.e. new technology versus more traditional industries. Not only should the schema be a stronger predictor of class characteristics than are these other variables, but its effects should not be greatly reduced by controlling for them.

A second approach is to examine the ability of the schema to account for the relationships between the class-characteristics items and variables such as class identification and partisanship; or conversely, to assess the role of class-characteristics items in accounting for the relations between the class schema and these variables. The aim of the first form of analysis is to evaluate whether the class schema captures the associations between direct measures of the

concept and suitable outcomes, and the aim of the second is to examine if the schema is fruitful in predicting other variables because of its ability to index class characteristics, rather than through spurious associations with factors such as income or education. Apart from its value as a validation exercise, such research can increase knowledge of which aspects of occupations are important for linking class (as measured by the schema) with other characteristics. This work is in progress and will be presented in future publications.

## NOTES

1. Writers influenced by Marxian ideas have been concerned more with conceptual and theoretical disputes than empirical measurement (e.g. Carchedi, 1977; Crompton and Gubbay, 1977; Poulantzas, 1978). See Parkin (1979) for a critique of such approaches.

2. The schema has sometimes been characterized as 'neo-Weberian', but it appears more accurate to consider it an amalgam of mainly, but not exclusively, Weberian and Marxian principles. Thus, although Erikson and Goldthorpe believe that 'the opposition between Marxist and Weberian conceptions of class . . . is in many respects exaggerated', they do accept that 'The principles of differentiation that we adopt have been mainly derived from classic sources, in particular, from Marx and Max Weber.' (p. 37).

3. A variety of interrelated types of validity testing exist. Concurrent validity, predictive validity, and convergent validity, for example, are all forms of criterion-related validity. For more detail on these terminological and substantive distinctions see, *inter alios*, Carmines and Zeller (1979), Cronbach and Meehl (1955), Nunnally (1978), and Bailey (1988).

4. See Goldthorpe (1982) for a more detailed exposition of the distinction between the service relationship and other forms of employment relations.

5. This includes both men and women. Differences between the sexes in the relationship between class position and occupational characteristics are examined elsewhere (Evans, 1991).

6. Unfortunately, there is no suitable question asking if and under what conditions payment is made when respondents are off sick. This is an aspect of the employment contract which one would expect to be an important distinguishing characteristic of service-class occupations. There is a question on the number of hours required each week to obtain the standard wage (Q47a), but the distribution of responses to this item suggests that respondents did not think of this question in terms of whether they are paid when they cannot work.

7. It should be noted that unlike Marshall *et al.* (1988: 78) we have not constructed a multi-item scale of supervision using the other supervision-related items in the survey, as these were only asked if respondents had first answered 'yes' to the item on whether they supervised other workers (Q57). This dependence artificially boosts the correlations between items, as it is assumed that all respondents who answered 'no' to the first item would have done so to the other items, which is unlikely to have been the case.

8. It is also interesting to note that there is a high degree of consistency in answers to the two supervision questions asked in the survey (Q57 and Q39d). Of the 310 respondents who said they supervised people in response to Q39d (which asked how many people they supervised), 305 also answered in the affirmative to Q57 (which simply asked if they supervised others, or not). This suggests that the answers to these questions are reliable.

9. There is little difference between the findings using the weighted principal components as scales or the unweighted Likert scales. The Likert scales are used as they allow the correlations between the dimensions of job characteristics to be examined and they are also the simplest way of weighting items.

10. A second version of the employment conditions scale also included the question on increments (Q51). The addition of this item failed to increase the reliability of the scale, and did not alter its relations with any other variable.

11. As the supervision item is dichotomous it could be thought preferable to use logistic regression to obtain parameter estimates rather than the OLS estimates shown in Table 6 (see Aldrich and Nelson, 1984). However, OLS estimates are used as they are of reasonable efficiency when the distribution of the dependent variable is not excessively skewed (above, for example, .9/.1, see Gillespie 1977), and have the advantage of being comparable to the other models presented in Tables 5 and 6. The choice of estimation procedure does not affect the substantive conclusions.

12. In some versions the men are allocated to class III and the women to class VII (Erikson and Goldthorpe, 1992).

13. There are so few respondents in class VIIb that their aggregation into class VII is not of great concern, even though there are considerable differences between their occupational characteristics and those of respondents in class VIIa. Moreover, the six VIIb respondents in our sample have very similar levels of working-class identification and political partisanship to those in class VIIa.

14. In analyses reported elsewhere (Evans, 1991) we show that both the structure of the job characteristics items and the strengths of their relations with social class are weaker for women than for men. This suggests that women's jobs are not likely to be as easily summarized by the Goldthorpe (or any other) schema as are men's. Nevertheless, the patterning of these and other differences between classes is very similar for both sexes, which indicates that the structure of women's occupations is similar, if less clearly defined, to that of men's.

15. We should note that these results are less clear-cut if we include *part-time* women workers in the analysis (not shown). A large proportion of III*b* women work part time and receive fewer of the benefits associated with a service relationship than do the full-time workers. Thus when part-time employees are included in the analysis, the III*b* respondents become less like those in class III*a*. However, as we have already pointed out, part-time workers would not usually be allocated to class positions on the basis of their own occupations (at least not by Erikson and Goldthorpe), but on their partners'. Therefore it makes more sense to examine full-time workers only.

16. This conclusion is also supported by an analysis of the association between membership of class III*b* and class identification, which is stronger when III*b* women are allocated to class III rather than class VII (Evans, 1991).

17. Unfortunately, due to a lack of cases we are unable to examine the implications of placing class VII*b* in class VII along with class VII*a*. This form of aggregation is an issue of some importance for cross-national studies involving countries with large agricultural sectors, but has less serious consequences for estimating the validity of the schema in Britain, where there are very few agricultural workers.

18. For example, the multiple correlation coefficient between the schema and the employment conditions scale is .64. If we correct for attenuation by dividing this coefficient by the square root of the reliability estimate of the scale ($\sqrt{.60}$), we obtain an estimated correlation of over .83.

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APPENDIX

*The wording and coding of the occupational characteristics items taken from the 1984 Essex class survey*

Q44a (Internal promotion) Use this card to say how high you think your chances are of being given a significant promotion within your present organization [definite, high chance, fifty-fifty, low chance, no chance].

Q45a (External promotion) Use this card to say how high you think your chances are of being promoted by changing employers [definite, high chance, fifty-fifty, low chance, no chance].

Q44a and Q45a were recoded to three point scales combining definite and high chance, and fifty-fifty and low chance categories.

Q45d (On career ladder) Thinking about getting promotion or going up a career ladder, is your present job a step in a recognized career or promotion ladder within your organization? [yes, no].

Q48 (Immediate way to pay rise) Thinking about the immediate future, in which ways on this card are you most likely to increase your present level of pay [longer hours, more productivity, promotion, union pay rise, own pay rise, second job, higher job in new organization, same job in new organization, other, no way of getting rise].

Q50 (Long-term way to pay rise) Thinking ahead a few years, which of the ways on this card do you think is most likely to lead to you getting an increased level of pay? [longer hours, more productivity, promotion, union pay rise, own pay rise, second job, higher job in new organization, same job in new organization, other, no way of getting rise].

Many of the response categories for both Q48 and Q50 had only a few cases in them. Responses to both questions were therefore recoded to promotion, versus longer hours, with a miscellaneous middle category.

Q47b (Clocks on) Are you required to clock or sign yourself in and off work? [yes, no].

Q47c (Pay for overtime) Are you paid for any over-time you work? [yes, no].

Q46 (Hourly rate versus basic wage) Which of the ways on this card best describes how you are paid in your present job? [hourly paid, performance, piece-work, basic plus commission/productivity, basic only, other].

Many of these response categories had only a few cases in them. They were therefore recoded to hourly paid and performance/piece work versus basic only, with the rest as a residual category.

Q51 (No annual increments) Is a composite of answers to a series of questions asked of different sections of the sample. Q51c and Q51d ask: Are you on a recognised pay scale (Q51c union, Q51d non-union) with specified annual increments [yes, no]. Q51e asks: Is your pay regularly reviewed each year, and Q51f asks: Can you discuss the possibility of a pay rise at any time in the year? Responses to these questions were recoded to a binary variable—no increments versus all other responses—as this was the only clear-cut distinction obtainable.

Q54    (Skill changes) Does your present job require more skill, less skill, or about the same amount of skill as when you first started to do it? [more skill, less skill, about the same amount of skill].

Q55a    (Designs own work) Is yours a job which allows you to design and plan important aspects of your own work or is your work largely defined for you? [self, other person].

Q56a    (Decides day-to-day tasks) Do you decide the specific tasks or jobs you carry out from day to day or does someone else? [self, other person].

Q56b    (Decides amount and pace) Does some-one else decide how much work you do or how fast you work during the day? [yes, no].

Q56c    (Decides start and finish) Can you decide, officially or unofficially, the time you arrive and leave work? [yes, no].

Q56e    (Can reduce work pace) Can you considerably slow down your pace of work for a day when you want to? [yes, no].

Q56g    (Can initiate new tasks) Can you decide on your own to introduce a new task or work assignment that you will do on your job? [yes, no].

Q57    (Supervises others) As part of your job do you supervise or manage the work of other employees? [yes, no].

Q47d    (Pay/gross income in £1000s) Which of the amounts on this card comes closest to your gross pay in this job; that is pay before tax and other deductions are made? [up to 2800; 2800–3999; 4000–4999; 5000–6999; 7000–8999; 9000–9999; 10000–11999; 12000–14999; 15000–19999; 20000–24999; 25000 and over].