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The importance of specificity in occupation-based social classifications

Vernon Gayle, Paul S. Lambert, Koon Leai Larry Tan, Kenneth Prandy, and Manfred Max Bergman

Abstract

Purpose – This paper aims to present reasons why social classifications which use occupations should seek to adopt “specific” approaches which are tailored to the country, time period and gender of the subjects under study.

Design/methodology/approach – The relative motivations for adopting a specific approach to

social classifications are discussed and theoretical perspectives on specificity and empirical evidence on the contribution of specific approaches are reviewed. Also the practical costs of implementing specific social classifications are evaluated, and the authors’ development of the “GEODE” data service (grid-enabled occupational data environment), which seeks to assist this process, is discussed.

Findings – Specific approaches make a non-trivial difference to the conclusions drawn from analyses of occupation-based social classifications. It is argued that the GEODE service has reduced the practical challenges of implementing specific measures.

Research limitations/implications – There remain conceptual and pragmatic challenges in working with specific occupation-based social classifications. Non-specific (“universal”) measures are adequate for many purposes.

Practical implications – The paper argues that there are few excuses for ignoring specific occupation-based social classifications.

Originality/value – The paper demonstrates that recent technological developments have shifted the balance in the long-standing debate between universal and specific approaches to occupation-based social classifications.

Keywords Jobs, Social differentiation, Classification, Survey

Paper type General review

1. Introduction

Occupations are ranked in the same order in most nations and over time. ... Hout referred to the pattern of invariance as the “Treiman constant” ... the Treiman constant may be the only universal sociologists have discovered (Hout and DiPrete, 2006, pp. 2-3).

Data used in this paper were supplied by the Cross National Equivalence File (Burkhauser *et al.*, 2001) and the UK Data Archive (University of Essex, 2006). The authors thank participants at the Cambridge Social Stratification Seminar for useful comments on a version of this paper.

Hout and DiPrete (2006) highlight the “Treiman constant” as the single most important empirical generalization to be confirmed through the long history of social stratification studies that they review. The “constant” is the idea that occupational positions have the same meanings across different countries and time periods (Treiman, 1977). This leads to a “universal” approach to occupation-based social classifications. It may be contrasted with a “specific” approach, in which the same occupations could lead to different positions in a social classification, dependent on contexts such as nation, time period, or gender. In contrast to Hout and DiPrete’s contention, in two recent papers the current authors have presented evidence of the enduring contribution which “specific” occupation-based social classifications can make (Lambert *et al.*, 2005; 2006).

In this paper, we discuss the relative merits of universal and specific approaches to occupation-based social classifications. It is widely agreed that best practice for exploiting occupational micro-data involves a two-stage process (e.g. Bechhofer, 1969; Marsh, 1986; Rose and Pevalin, 2003). One should first translate the original occupational record into a published index of occupational positions, such as an occupational unit group scheme. Second, one should translate these positions, according to a published translation key, into one or more a substantively meaningful social classifications, such as a class scheme or occupational ranking.

At both stages of this process, researchers may adopt “universal” or “specific” strategies. Four positions result, illustrated schematically in Table I. Universal approaches include those which use an occupational unit group scheme that is harmonised across multiple contexts (such as ISCO-88, intended to be valid for all countries between 1988 and 2008, see Hoffman, 2003). Also universal are approaches which use a social classification translation key that applies the same classification rules across multiple contexts. Specific approaches on the other hand may use a different occupational unit group scheme for each context. Similarly, a specific translation may adopt particular rules and operations which vary across contexts.

Here, we focus on three “social contexts” over which occupation-based social classifications can be specific. These are time periods, countries, and gender. The first two contexts are the classic focus of comparative methodological literatures.

	Stage 2: translation of occupational index into social classification	
Stage 1: coding of occupational data	Universal same occs. to same positions in all circumstances	Specific same occs. may go to different positions in different contexts
Universal (harmonised unit group scheme)	(1) Fully universal examples: Ganzeboom and Treiman (2003), ISCO-88 and ISEI schemes	(3) Partially specific examples (rare): Lambert <i>et al.</i> (2005) cross-national analysis, ISCO-88 with national CAMSIS scales
Specific (contextual unit group scheme)	(2) Partially universal examples (common): Erikson and Goldthorpe (1992), occupations coded to national unit groups, translated to CASMIN class	(4) Fully specific examples: Blackburn and Jarman (2006), occupations coded to national unit groups, translated to national CAMSIS schemes

Table I.
Universality and specificity in occupation-based social classifications

The impact of gender on occupational measures has mostly been discussed in literature within particular national and temporal contexts (e.g. Martin and Roberts, 1984; Crompton and Mann, 1994). We argue that gender differences in occupational distributions are so deep-rooted that their consideration should be central to any evaluation of occupation-based social classifications (cf. Prandy, 1986).

One complicating factor is that preferences for universality or specificity in occupation-based social classifications have been linked with preferences between alternative social classifications. For instance, those who have advocated understanding occupational structures in terms of a socio-economic status hierarchy have tended to favour a “fully universal” approach (e.g. Ganzeboom and Treiman, 2003). Those who have argued that the structure of occupational positions should be understood through analysing patterns of social interactions between occupations have tended to favour a “fully specific” approach (e.g. Prandy and Jones, 2001; Chan, 2006). Class analysts have often adopted a “partially universal” approach, whereby a universal occupational class classification is favoured, but its operationalisation involves adopting specific coding processes which are dependent upon the social context (see for example, Erikson and Goldthorpe, 1992; Wright, 1997; Rose and Pevalin, 2003; Harrison, 2006). This linkage between preferred strategy for occupational measurement, and a universal or specific approach, is unfortunate, as there is no necessary corollary. For instance, universal measures such as International socio-economic index (ISEI) can be meaningfully derived in specific ways (e.g. Wong and Xiaogang, 2006), and specific measures such as CAMSIS may be averaged across contexts and analysed in a universal way (e.g. Lambert *et al.*, 2006).

We summarise below three areas of debate between universal and specific approaches to occupation-based social classifications. These concern theoretical positions, empirical evidence, and issues in the practical implementation of universal and specific measures. Our review leads us to advocate greater exploitation of specific approaches.

2. The theoretical case for specificity

The idea of indexing a person’s origin and destination by occupation is weakened if the meaning of being, say, a manual worker is not the same at origin and destination. Historical comparisons become unreliable (Payne, 1992, p. 220, cited in Bottero, 2005, p. 65).

The sentiment expressed in Payne’s observation finds widespread support. Payne’s point is to raise the possibility of specificity in occupation-based social classifications. There are in fact no influential methodological positions which deny such a possibility on a priori grounds. For instance, Goldthorpe’s works (Goldthorpe’s, 2000), which instantiate the methodological preferences of many empirically oriented social survey researchers, have stressed the value in making measurements contingent upon national and temporal contexts. Alternatively, post-modernist methodological statements have anticipated inconsistencies in attempts to measure fluid stratification structures (e.g. Pakulski and Waters, 1996), whilst sociological philosophers have explicitly opposed universal definitions of class or occupational positions (e.g. Sayer, 2005, chapter 4).

We argue that there are six attractions, on theoretical grounds, to specific approaches to occupation-based social classifications (A1-A6):

- (1) (A1) Specificity is better able to engage with the many sociological theories and hypotheses which anticipate changing social circumstances to occupational

positions across countries, time periods or gender (including the example of social mobility research, the background to Payne's comment cited above). For instance, Marxist accounts of the labour process make frequent reference to transformations in the meaning of occupations over time (cf. Wright, 1997). Contemporary Weberian and Durkhiemian approaches to class analysis have also revised their interpretation of social positions to reflect changing occupational structures between countries and over time (esp. Wright, 2005). Feminist literature emphasises the varying contexts of women's employment, and has advocated occupation-based social classifications which are contingent upon gender (e.g. Martin and Roberts, 1984; O'Reilly, 1996; Reay, 1998). Collins (2000) offers an account for the interplay of structural stratification forces and individual lives, favouring any number of contingencies and specificities in a characterisation of stratification positions.

- (2) (A2) Specific classifications are better able to exploit a finer level of occupational detail in deriving occupation-based social classifications (e.g. Prandy and Jones, 2001). This arises because they are able to use different details conditional on the appropriate context. Indeed, by permitting variations in the recording of occupational details, specific measures also have better opportunities to acknowledge the impact of local regulations, definitions, and anomalies in the measurement and classification of occupational positions.
- (3) (A3) Specific measures follow an "output harmonisation" model of equivalence in comparative research. Specific classifications may be standardised around the average of their relevant context, meaning that the specific measure indicates relative position within the structure of the social context. Hoffmeyer-Zlotnick and Wolf (2003) compare strategies of input and output harmonisation. Input harmonisation is typical of universal occupational measures, involving the imposition of the same external definitions across contexts. Although input harmonisation is presented as the preferred choice for tightly coordinated comparative projects (e.g. Harkness *et al.*, 2003), output harmonisation records data in its original units, and is argued to be more sensitive to local contextual differences.
- (4) (A4) Specific and universal measures are both amenable to the conduct of social research in a scientific manner. Steuer (2003) argues that a cornerstone of a scientific approach to sociological study is cumulative and replicable empirical research. In occupational research, this may be taken as calling for clear documentation during the processes of coding and translating source occupational records, as well as clear interpretation of analyses of social classifications. It is sometimes suggested that universal measures are better suited to both requirements since they promote shared standardized measures and deal with consistent theoretical constructs (esp. Goldthorpe, 2005; van Leeuwen *et al.*, 2004). However, this priority is somewhat misleading, since specific approaches may also be fully documented (cf. section 4), and they may be analysed in a comparable way across contexts (cf. A3).
- (5) (A5) Specific measures are more likely to make non-trivial differences to analytical conclusions the wider the range of social contexts being compared. Recent trends in comparative analysis have widened the range of contexts under study, for instance by growth in the number of cross-national survey

projects and the number of countries involved, and through extending the period of data readily available for comparisons.

- (6) (A6) Specific measures are better suited to conveying detailed information on a single social context. Whilst the orientation of this review is to comparative approaches, it should be remembered that even within a comparative framework, researchers often wish to present focussed results on a single social context, where attention to specific occupational structures is highly desirable.

Equally, there are two difficulties to working with specific social classifications (B1 and B2):

- (1) (B1) Specific measures have a danger of being impossibly relativist, since there are no agreed criteria on how specific an analyst should be. It has been argued, for example, that relative occupational positions also follow a different structure between different regional localities, or ethnic groups, within a nation (e.g. Schadee and Schizzerotto, 1987; Green and Owen, 1995). Specific social classifications have hitherto used contexts of countries, (decennial) time periods and gender – but there is no objection, in theory, to greater relativism in specific approaches.
- (2) (B2) Specific measures are more vulnerable to measurement and classification errors. This arises because most specific classifications rely on some degree of empirical estimation of the classification position within the context, and this estimation may be vulnerable to sampling instability. Measurement errors may also be induced by the transferral and management of additional occupational records, and new specific measures may generally expect to receive less extended review than longer established universal measures.

3. Empirical evidence on specificity and universality

In earlier literature, the question of whether a single, universal occupation-based social classification might be adequate was frequently evaluated (e.g. Hodge *et al.*, 1953; Inekeles and Rossi, 1956; Duncan, 1961; Treiman, 1977). The consistent conclusion, from comparing between countries and time periods, was that all occupation-based measures demonstrated high correlations. Such correlations were usually taken to imply that universal approaches to occupational measures were adequate, although a few researchers did demonstrate circumstances when specific measures could provide an additional contribution (e.g. Blishen, 1958; Fox and Miller, 1966), albeit one of ostensibly diminishing returns (Treiman, 1977).

Few empirical evaluations have continued those traditions into more recent decades[1]. Most recent accounts have involved defending the robustness of a certain universal approach to cross-national analyses. Thus, Ganzeboom and Treiman (2003), Oesch (2006), and Harrison (2006) present analyses which demonstrate high correlations in the properties of their favoured universal measure(s) between countries. Although helpful, these demonstrations do not offer an evaluation of the measures in contrast to alternative, specific classifications. They also tend to neglect temporal and gender variations.

Lambert *et al.* (2005) provide one recent descriptive study of specificity across a wide range of social contexts by using four major contemporary collections of cross-nationally harmonised survey datasets[2]. They report numerous instances where patterns of association between occupation-based social classifications, and other

socio-economic and socio-demographic measures, vary moderately between different universal and specific classifications. Differences are more pronounced when comparing economies from Eastern and Western Europe; and when studying occupational groups associated with farming, or with high levels of gender segregation. However, Lambert *et al.*'s descriptive analysis also emphasises that the magnitude of difference between universal and specific approaches is small.

As further illustration, Table II summarises cross-national differences in the circumstances of a selection of occupational groups defined under the ISCO-68 unit group scheme (ILO, 1969). It shows numerous examples whereby the average characteristics of members of an occupational group differ between countries, even

	% Female	% Full time	Mean income/ 1,000	% Post-school qualifications	% Subjective health is good
ISCO-68 minor groups (by country)					
<i>2 – architects, engineers</i>					
GB	4	84	19	75	86
DE	26*	84*	28*	56*	68
US	11**	94	49**	91*	78
<i>13 – educators</i>					
GB	70	57	13	86	84
DE	51*	58**	27	70*	63
US	74**	41*	27**	93*	81**
<i>21 – business leaders</i>					
GB	27	83	20	51	87
DE	16**	94	37**	32	62
US	34**	87	36*	63*	75
<i>53 – cook/waiter</i>					
GB	67	49	5	11	66
DE	72*	57	12	0*	68**
US	82*	36*	10	18	55
<i>84 – machine fitter</i>					
GB	23	79	10	11	78
DE	17	93	23	1*	58
US	10*	88	25	18	63
<i>98 – transport operative</i>					
GB	8	73	11	11	82
DE	7	90	23	4**	57**
US	9	86	23**	17	61**
<i>99 – labourer/craftsman</i>					
GB	14	65	9	14	84
DE	44*	66	15**	2*	54**
US	23*	74	20	19	51*
<i>All occupations</i>					
GB	48	62	11	32	82
DE	41	74	22	20	65
US	47	71	26	50	69

Table II.
Circumstances of
selected occupations in
Britain, Germany and
USA

Notes: Samples consist of unweighted CNEF main sample employed adults, $N \frac{1}{4}$ 3,800 (GB); 3,448 (Germany); 4,169 (USA) (listwise deletion of missing data); */**: ratio [(average-occupational statistic)/average] exceeds British ratio by 0.2/0.1; occupations selected such that 50 or more cases represent all occupations in all time points

Source: CNEF 1991 surveys, employees working full or part time only

when the contexts under study are three relatively advantaged economies in the contemporary period.

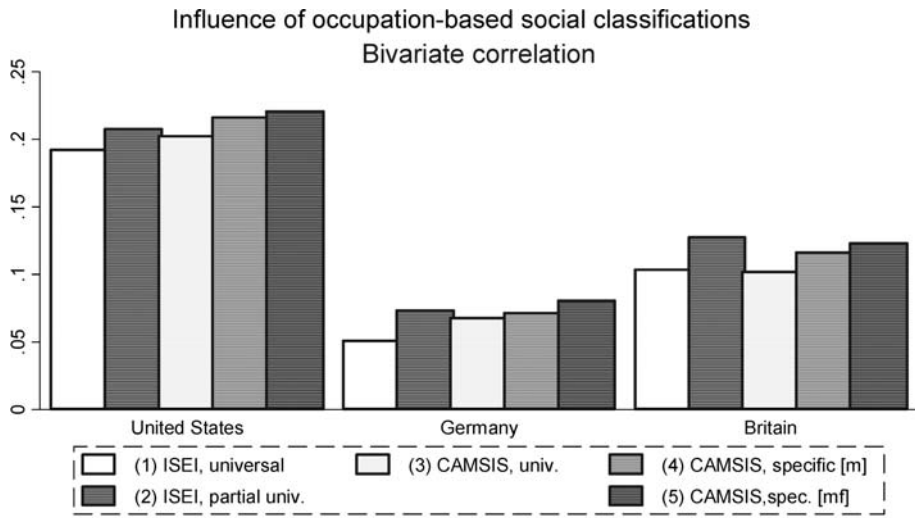
Some other publications have reported significant differences in the properties of occupational measures and occupation-based social classifications: over time periods (e.g. Brewer, 1986; CTEHP, 1999); between countries (e.g. Jarman *et al.*, 1999; Zhou, 2005); and between men and women (e.g. Prandy, 1986; England *et al.*, 1994). However, other descriptive reviews of occupational positions have concluded that there is little evidence of substantial change in circumstances over contexts (for example, Huang, 2001). Some authors have also argued that much more limited occupational records may adequately summarise social positions, given the general cross-context robustness of occupational measures (Ganzeboom, 2005; Albrecht *et al.*, 2002).

It is clear that much depends upon where the analyst chooses to place the emphasis on difference or similarity. For instance, Prandy and Lambert (2003) reported correlations of the order of 0.9 between male and female CAMSIS occupational scales for contemporary Britain, and concluded that the lack of exact equivalence was evidence for specificity. Chan and Goldthorpe (2004) used closely related methods and datasets, and found the same magnitude of male-female correlation, but used this to argue that male and female occupational measures were broadly equivalent in the period.

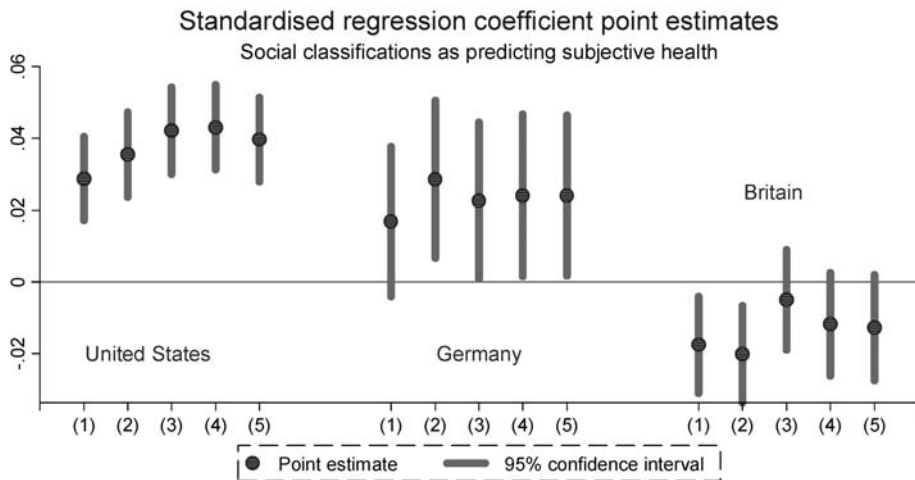
In order to persuade a sceptical reader that empirical evidence favours a specific approach, it may be necessary to demonstrate more enduring analytical impacts of specificity. In one example, Lambert *et al.* (2006) reviewed occupation-based social classifications on datasets from six countries spanning the period 1800-1938. Their analysis showed differences in the locations of occupations according to universal and specific measures, and observed that historical changes in occupational circumstances over time, measured by specific approaches but ignored by universal measures, were aligned to expectations of changing occupational structures. Additionally, Lambert *et al.* (2006) tested the efficiency of occupation-based social classification derivation models which imposed alternatively universal and specific constraints in a nested framework. They found the additional explanation offered by specific extensions (by time period, country, and gender) were statistically significant and improved model parsimony.

Figures 1 and 2 summarise further evidence of the small but significant continued impact of specificity on contemporary survey data from Britain, the United States, and Germany. The figures use data from the Cross National Equivalence File (Burkhauser *et al.*, 2001), augmented with occupational records extracted from the original micro-data for the three surveys. Our reason for using this dataset is that it is a major study collected and stored to particularly high standards. One methodological perspective is that the longitudinal panel data of this study offer us particularly detailed information on the circumstances of the respondents. By taking care to specify detailed panel regression models, we might come close to fully controlling for other factors and ultimately measuring the “true” effects of occupation-based social classifications.

Figures 1 and 2 present the effects of five different occupation-based social classifications. The first uses a fully universal implementation of the ISEI metric (using ISCO-68 occupations and the ISEI translation of Ganzeboom, 2007). The second uses a partially universal implementation of ISEI (using the standard translation file, based upon national occupational unit groups in each country). The third uses a universal implementation of the CAMSIS metric (CAMSIS scores mapped to ISCO-68 as a cross-national average score). The fourth and fifth measures use specific versions of the CAMSIS metric, using the national scales on national occupational unit group records.



Correlation = between-cases correlation subjective health to (1)-(5), random effects panel model.



Regression: population averaged panel model predicting subjective health, other controls for age, gender, education, minority ethnicity, selection probability (to full time work).

Source: CNEF 1991-2001 full time workers, N = 6988 U.S., 4044 Germany, 4343 Britain

Figure 1. Subjective health and social classifications

The fourth measure uses the male version of the scale for all respondents, whilst the fifth uses the male and the female scale.

Figure 1 shows the impact of alternative approaches to occupation-based social classifications through an examination of the effect of stratification position upon self-reported subjective health. The first panel shows small differences according to different universal and specific measures. In all three countries, it is noticeable that the correlation is stronger for specific measures, and stronger for gender-specific measures in the case of the CAMSIS scores. Equally, the panel reiterates that the magnitude of difference is not substantial.

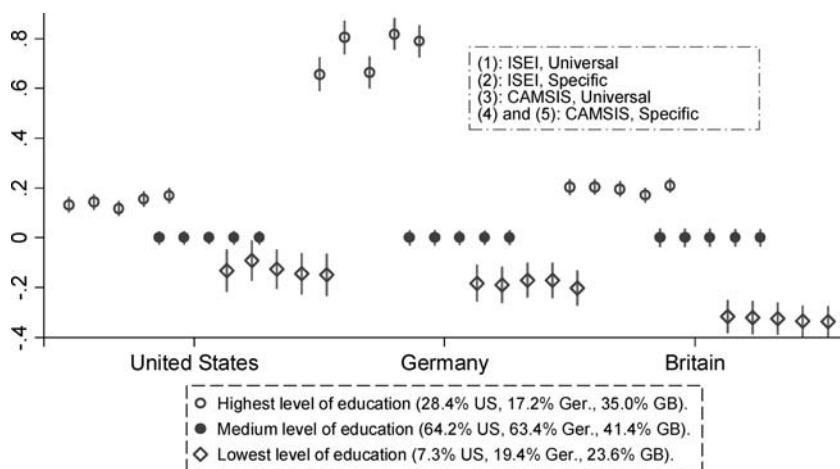


Figure 2.
Education effects on
occupational attainment

Source: CNEF Data as Figure 1. Estimates for 5 different social classification outcomes (1. to 5. of Fig. 1). Graph shows standardised regression coefficients predicting classification, plus quasi-variance 99% comparison interval. Model: Population averaged panel, controls for quadratic age, gender, gender*age, subjective health, minority ethnicity, marital status, and Heckman selection effect for full time working

The second panel of Figure 1 looks in greater detail at the relation between stratification position and subjective good health. It shows the coefficient of stratification advantage on subjective health after controlling for other socio-demographic factors (including the repeated contacts panel data's inherent controls for residual heterogeneity). It illustrates small differences in predicted effects between universal and specific measures. Again however the differences are small – none are of a magnitude to substantially alter conclusions, since the confidence intervals within countries overlap.

Figure 2 uses a similar procedure to the second panel of Figure 1, reporting the residual effects of educational levels on stratification positions. In this case, in Germany and to a lesser extent in Britain and the US, there are significant differences between the estimated effects of education, depending on which occupation-based measures are used. The effects associated with specific measures tend to be greater. Although the differences do not appear that large, the point of this analysis is to show their persistence to a detailed level of statistical control.

4. Practical issues in the implementation of specific measures

The uptake of specific measures of occupation-based social classifications has been very limited, despite their consonance with many theoretical perspectives. Instead, most researchers adopt a fully or partially universal strategy.

A likely explanation is that analysts tend to choose between occupation-based social classifications in large part on the basis of convenience of access and communication, rather than on theoretical grounds. It may seem preferable that social researchers should be open to a variety of alternative universal and specific measures for any given empirical study. However, to implement alternative occupation-based

social classifications can be a demanding process of data management, particularly so in the case of specific schemes. As an indication, the specific analyses behind Figures 1 and 2 took approximately six times longer to prepare than the fully universal model.

The implementation of alternative social classifications requires “occupational information resources”, such as databases of translation keys linking occupational unit groups with social classification positions. Over the last decade, the Internet has increasingly been used to provide facilities for supplying occupational information resources. In principle, websites such as ISMF (Ganzeboom, 2007) and CAMSIS (Lambert and Prandy, 2007) provide tools to allow analysts to download numerous alternative classification files and implement them across different social contexts. These websites offer data files in relatively simple tabular formats and furnish user instructions in implementing alternative translations. Nevertheless, they are not widely exploited by social researchers. One likely problem is that they have generated a bewildering array of alternative occupational information resources, stored across different Internet locations, in inconsistent formats, with limited documentation, and with unpredictable updating and revision over time.

In a recent development, several of the authors of this paper have undertaken a project which attempts to use newly emerging computing technologies to develop an improved indexing service for occupational information resources. The project grid enabled occupational data environment (GEODE, see www.geode.stir.ac.uk) involves developing a depository of occupational information resources which are indexed by a consistent set of descriptive metadata (using a standard developed through the Data Documentation Initiative, www.icpsr.umich.edu/DDI/). The service exploits Grid computing technologies (which are associated with the management of distributed data resources and virtual research communities) in order to provide an efficient index record for occupational resources, and to provide a system for managing the supply of resources to social researchers (see Tan *et al.*, 2006).

Access to the GEODE service is achieved through a user-friendly web “portal”. Full instructions on the facilities available through this portal are given at www.geode.stir.ac.uk. Developmental work on the GEODE service is still ongoing, but since January 2007 users of GEODE have been able to:

- (1) Search and browse across occupational information resources indexed with the service.
- (2) Download, and/or follow Internet links to, original occupational information resources.
- (3) Deposit new occupational information resources for distribution to other social scientists.
- (4) Undertake an automated file matching procedure in a secure environment, to allow linkage between the user’s micro-social data, and suitable occupational information resources such as social classification translation indexes.

The last innovation is critical in encouraging access to alternative occupation-based social classifications. Through this service it is possible to facilitate the easy matching of occupational records in a manner not previously available. This makes the rapid implementation of alternative universal and specific occupation-based social classifications a practical possibility.

5. Conclusions

We agree with many of the comments of Hout and DiPrete (2006) concerning the desirability of coordinated use of occupational measures, and our review leads us to maintain, like Hout and DiPrete, that the principle of the Treiman constant is sound advice for many purposes.

Nevertheless, our review illustrates a number of methodological and theoretical principles which may attract researchers to a specific rather than a universal approach to occupation-based social classifications. As such, it is difficult to explain the limited uptake of specific classifications in empirical research. It is certainly likely that the practical requirements of deriving specific measures are off-putting. It also seems likely that it is felt to be cognitively easier when conducting and communicating research to talk in universal rather than specific terms. This perception is misleading; for instance, the widespread use of income measures, which are standardised within national, temporal and gender contexts, demonstrates how a specific measure can be readily understood by a wide audience. Certainly, it is possible to demonstrate, as in our example analyses, that there can be more empirical benefits to a specific approach than are widely appreciated. They are particularly pronounced in comparative analyses involving a wide range of countries and longer time periods, but they are persistent across a variety of research designs.

The principle of the Treiman constant ultimately emerges from a cost-benefit analysis, in which specific approaches are felt to be complex and time-consuming whilst generating minimal differences from universal strategies. However, Internet facilities, such as those prepared through the GEODE project, can dramatically reduce the costs of specific approaches. Contrary to popular perceptions, specificity may now be readily incorporated into occupational analyses, and may lead to more empirically and theoretically satisfactory results.

Notes

1. By contrast, sociological research has been dominated by pluralistic approaches to occupation-based social classifications, with more and more schemes produced and offered as potential tools of analysis. Specialists in stratification methodology have often been critical of such pluralism (e.g. Bechhofer, 1969; Marsh, 1986; Hout and DiPrete, 2006), as it is seen to impede consistency and comparability in research (also Bollen *et al.*, 2001; 't Mannetje and Kromhout, 2003). Indeed the force of pluralism is well illustrated by the context of Hout and DiPrete's (2006) article, which advocates a universal approach. It is published within a journal issue surrounded by five other articles which use occupation-based social classifications, but which each use different measures, and never the measure advocated by Hout and DiPrete.
2. Lambert *et al.* (2005) used data from the Luxembourg Income Study (www.lisproject.org); the CHER panel survey project (<http://www.ceps.lu/cher/accueil.cfm>); the International Social Survey Programme (www.issp.org); and the European Social Survey (www.europeansocialsurvey.org).

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