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TRENDS IN OCCUPATIONAL SEGREGATION BY GENDER IN ENGLAND AND WALES: Longitudinal evidence

Daniel Guinea-Martin Office for National Statistics

Jane Elliott Institute of Education

Unlike most countries, the UK has several quantitative longitudinal studies that are an extraordinary resource for studying social change. However, with the exception of comparisons between the British Birth Cohorts (of people born in 1946, 1958 and 1970), there have been limited attempts to compare findings from these longitudinal resources. This project studies occupational sex segregation in the 1958 British Birth Cohort (also known as the National Child Development Study or NCDS), and in a comparable cohort (named LS50s) drawn from the Office for National Statistics (ONS) Longitudinal Study (LS). We concentrate on the 1990s, a decade of major changes in the labour market. The NCDS and the LS collected data at almost equal intervals: in 1991 (both), in 2000 (NCDS) and in 2001 (LS).

The comparison focuses on changes in occupational segregation between the sexes during the 1990s. With a few notable exceptions (Jacobs, 1989; Jacobs, 1995; Chan, 1999), the majority of research on occupational segregation to date has used cross-sectional data to derive aggregated indices (for example, see Hakim, 1998; Blackburn *et al.*, 2000). By using longitudinal data, it is also possible to examine the extent to which individuals stay in or move between, sex integrated and sex segregated occupations. Recent research on aggregate levels of employment segregation in England and Wales has shown a remarkable decline during the 1990s (Blackwell and Guinea-Martin, 2005). This suggests that there has been an increase in the rates of individual mobility towards sex atypical or integrated occupations.

Key findings from the research are as follows:

- Overall, the NCDS and LS50s produce similar results in relation to the labour market profiles of their members in 1991 and 2000/1.
- The percentage of individuals in the LS50s and NCDS who remained in the same state, whether in the same occupational major group or out of work, is very similar (52.3% and 53.8% of men and 43% and 42.9% of women respectively). This allays fears that the NCDS may underestimate occupational mobility due to the difficulties of tracing cohort members who are geographically mobile.
- Analysis of economic position in 1991 and 2000/1 yields similar percentages of members of both data sets in work and not in work in both years, as well as alternating work and non-work. NCDS-based analysis of the employment histories suggests that these subgroups are substantively real rather than spuriously created by the position individuals happened to be in at the time of the interview. That is, for example, on average people in work in both years were also in work during more than 95% of the time between interviews. On the other hand, women not in work in either year spent, on average, only 17% of the time between interviews in work (and the equivalent men 28% of the time).
- In both data sets, the most remarkable change over the decade in terms of their employment profile was the incorporation of women into paid employment by 2000/1 – around 20% of women in each sample were out of work in 1991 (mostly due to childrearing) but in work in 2000/1. This confirms the type of female engagement with the labour market in England and Wales: continuous in the case of childless women and interrupted at the time of childrearing for the rest.
- As the men and women of the cohort born in and around 1958 aged from their early thirties in 1991 to their early forties in 2000/1, their occupational segregation from each other remained relatively stable, though with a slight tendency to decline. This happened in spite of a great rate of occupational mobility; in fact, more than 63% of the members of both data sets who were in work in 1991 and in 2000/1 changed occupations.

- The reason for the observed stability in the aggregate level of occupational sex segregation arises from the fact that individual mobility was restricted to occupations with similar sex profiles; in addition, when individuals moved across occupations with different sex profiles, these moves cancelled each other out, particularly among men.

- On the other hand, the slight decline in the aggregate level of occupational sex segregation (which was not statistically significant) reflected the fact that female moves across sex types did not cancel out completely; a greater percentage of women in work in both years left female dominated occupations than moved to them. However, women who moved from non-employment to work were found predominantly in female occupations.

- In spite of these similarities between NCDS and LS50s, there are systematic differences between the data sets. The largest discrepancy is for highest academic qualification; this reflects both the effects of attrition on the NCDS (biasing the sample towards the most qualified), and the limitations of the Census questionnaire and mode of administration in relation to this topic area.

- The use of loglinear modelling to explore occupational mobility revealed some small but significant differences between the data sets. This method highlighted the greater stability of NCDS members in some of the most prestigious occupational major groups (Managers, Professionals and Associated Professionals), as well as the greater proportion of LS50s men remaining out of work in both years.

Data

The variables used in the analyses have been harmonised. Moreover, the datasets themselves were harmonised by bringing together, as far as possible, the sampling criteria of each study. For example, given that the LS covers England and Wales only, NCDS members living in Scotland in either 1991 or 2000 were excluded. In the LS, cohort members born overseas who immigrated when they were 16 or older were dropped, because people with these characteristics are not included in the NCDS. The only step away from harmonisation *strictu sensu* was the year of birth criteria for inclusion in the LS-based cohort. Restricting the sample to people born in 1958 meant that this cohort had fewer members than the NCDS. Therefore, we included LS members born in 1957 and 1959 as well. The longitudinal LS50s sample had 19,037 members, while the NCDS equivalent contained 8,948 individuals.

In terms of attrition between 1991 and 2000/1, the NCDS had only a slightly higher rate (13%) than the LS50s (11%). But it is worth noting that the LS50s cohort was based on the overall 1991 LS sample, itself based on the Census of compulsory completion. In contrast, the NCDS is affected by refusals to participate in the Study (5% of the 1991 respondents declined to participate in 2000). In addition, by 2000 the NCDS cohort had 66% of the original sample of 1958.

Finally, in order to study occupational mobility with the aid of loglinear modelling, a new and reduced dataset was created with the two studies combined. In it we kept only occupations in 1991 (the variable 'origin') and 2001 (the variable 'destination'), coded to the nine major groups of SOC90 plus a residual category for members not in paid employment. The third variable was a dummy that identified the cohort of origin (NCDS versus LS50s).

Economic activity

In both 1991 and 2000/1, there were slightly more NCDS members in full-time employment than LS50s members (excluding the self-employed). The contrary is true for housewives and the unemployed, particularly in 1991, a period of recession in the British economy. These differences between data sets are small but consistent. Of greater magnitude were the differences in female work rates over the decade, with an increase of more than 11 percentage points, contrasting with the male stability. In fact, one in five women was in work in their early forties (in 2000/1) but not in their early thirties (in 1991), a time when 41.2% of women in the NCDS sample reported having children aged 4 or under in the household.

In order to explore individuals' employment behaviour in-between interview dates by using the NCDS, we first classified members into four groups: people in work at the time of both data collection points; people not in work at either time; and finally, people in work at one time only. The relative sizes of each of these groups were similar in both data sets. We then used NCDS employment histories to know the amount of time that, on average, each of these groups had spent in work during the 1990s (Table 1). This exercise confirmed that the NCDS people in work in both years spent most of the time between data collection sweeps in work. Interestingly, people in work at only one interview actually spent around three quarters of the time between interviews in work. Finally, we confirmed that people not in work at either interview spent only a small proportion of the time between interviews in work. In other words, their economic activity at the time of the interview did not reflect a quirk somehow related to the timing of the data collection process, but rather their consistently low likelihood of being in work.

Economic position 1991-2001	NCDS men		NCDS women	
	% of time in work	St. Dev.	% of time in work	St. Dev.
Work-work	98.5	9.1	96.2	14.9
Work-not in work	68.5	31.0	66.7	31.2
Not in work-work	77.8	31.2	67.1	32.2
Not in work-not in work	27.6	35.5	16.7	30.2

TABLE 1. TIME IN WORK BETWEEN 1991 AND 2000
Source: Authors' analysis of NCDS

Current occupation

We studied occupational mobility with a reduced dataset. Using loglinear modelling, we tested the hypothesis that origin occupation and destination occupation were associated, but that such an association was independent of data source (as expected if each dataset produced completely comparable data). However, the expected frequencies produced by this model were significantly different from the observed frequencies (p-value<0.001), because origin and destination were also associated with data source. The model's standardised residuals identified the cells responsible for the differences between the two data sets. The results indicate that the greater stability of NCDS members in three of the most prestigious occupational major groups (Managers, Professionals and Associated Professionals), together with the greater propensity of LS men to remain out of work, were responsible for most of the differences in occupational mobility between the two datasets (Table 2).

Transitions with more NCDS men and fewer LS50s men than expected	Transitions with more NCDS women and fewer LS50s women than expected
Associated Professionals to Associated Professionals Managers to Managers	Associated Professionals to Associated Professionals Professionals to Professionals Personal to Personal
Transitions with fewer NCDS men and more LS50s men than expected	Transitions with fewer NCDS women and more LS50s women than expected
Non-work to: Personal Non-work	None

TABLE 2. TRANSITIONS WITH STANDARDISED RESIDUALS EQUAL OR GREATER THAN |1.96| UNDER THE ASSUMPTIONS OF THE CONDITIONAL INDEPENDENCE MODEL
Source: Authors' analysis of LS and NCDS

Notes: Only transitions with n≥50 in each dataset are included

Occupational segregation

Whereas aggregate levels of overall occupational sex segregation showed the sharpest decline in a century during the 1990s, women and men born in the late 1950s were almost as segregated from one another in their early thirties as they were in their early forties (we measure segregation by using the Gini coefficient and the Index of Dissimilarity, (ID) both ranging from 1, complete segregation, to 0, complete integration).

However, the stability of the aggregated indices of occupational sex segregation (Table 3) masked considerable mobility at the individual level, with more than 60% of all cohort members in work in both years changing occupations (Table 4).

Given the great deal of individual occupational mobility, how can we explain the stability of the aggregate indices? The answer lies in the fact that many moves were between occupations in the same sex type, particularly among men. Of those men who changed occupations between 1991 and 2001, around half stayed in male occupations compared with only around 38% of equivalent women who remained in female dominated occupations. In addition, male moves across occupational sex types cancelled each other out. For example, around 4% of male occupational movers went from male to female dominated occupations, but approximately the same percentage moved in the opposite direction.

The small decline in the aggregated indices (-0.01), instead, reflects the fact that female occupational movers tended to slightly increase their presence in sex atypical occupations. This tendency towards the feminisation of male and integrated occupations, however, was reversed when the analysis included people not in work in either year. This latter group was substantial, and predominantly female, in 1991; it greatly reduced in size by 2000/1 because most of its incumbents had joined the labour market and were in female dominated occupations. The latter had a growth of 9.8 percentage points in their female rates of employment in the case of the LS50s, and 7.7 percentage points in the case of the NCDS (Table 5).

Recent research on the sex typing of occupations confirms for the overall labour market what we have established for occupational movers only: in the 1990s there was a trend towards the feminisation of occupations (Grimshaw and Rubery, 2007). For future research into this matter, a sample of all people in work in the LS could be used; given

	1991		2000/1		Change	
	Gini	ID	Gini	ID	Gini	ID
NCDS	0.78 (0.76-0.79)	0.61 (0.59-0.63)	0.77 (0.76-0.79)	0.60 (0.58-0.62)	-0.01	-0.01
LS50s	0.76 (0.75-0.77)	0.60 (0.58-0.61)	0.75 (0.74-0.76)	0.58 (0.57-0.59)	-0.01	-0.02

TABLE 3. GINI COEFFICIENTS AND INDEXES OF DISSIMILARITY OF OCCUPATIONAL SEX SEGREGATION FOR THE NCDS AND LS50S DATA SETS (1991-2000/1)
Source: Authors' analysis of LS and NCDS

Note: Confidence intervals between brackets.

	NCDS			LS50s		
	Men	Women	All	Men	Women	All
Mover %	62.9	69.0	65.5	60.8	67.5	63.5
Stayer %	37.1	31.0	34.5	39.2	32.5	36.5

TABLE 4. OCCUPATIONAL MOVERS AND STAYERS
Source: Authors' analysis of LS and NCDS

Note: Only people in employment in 1991 and 2001 are included.

	NCDS 2001 sex types						LS50s 2001 sex types					
1991 Sex types	Male %	Integrated %	Female %	Non-work %	Total %	Marginal difference	Male %	Integrated %	Female %	Non-work %	Total %	Marginal difference
Male	3.1	1.7	1.7	1.3	7.8	0.4	3.4	1.6	1.7	1.1	7.8	2.0
Integrated	1.5	8.9	5.4	2.4	18.2	3.7	1.8	7.4	4.8	2.4	16.3	2.5
Female	2.2	6.3	27.9	5.6	42.0	7.7	2.7	5.4	25.0	5.2	38.3	9.8
Non-work	1.4	5.0	14.7	10.8	31.9	-11.8	1.9	4.5	16.5	14.7	37.7	-14.2
Total	8.2	21.9	49.7	20.1	100.0		9.7	18.9	48.0	23.4	100.0	

TABLE 5. FEMALE TRANSITIONS ACROSS SEX-TYPED OCCUPATIONS (CELL PERCENTAGES)
Source: Authors' analysis of LS and NCDS

Note: Occupations classified into sex-types on the basis of one lookup table with percentage female derived from the 10% sample of the 1991 Census (Hakim, 1998).

that the LS is the only large dataset with occupational information coded to SOC90 in both 1991 and 2001, we could use it to identify the effect of individual moves on the relative sizes of the three occupational sex types.

Another direction for future research suggested by this project is to expand the comparison. Firstly, by incorporating the 1980s into the analysis, and secondly, by analysing also the 1970 British Birth Cohort and a comparable cohort drawn from the LS. Taken together, these two steps would allow the isolation of age, cohort and period effects. Thirdly, the substantive objectives of the study could become more ambitious by operationalising the duration of employment in each sex type as a variable; while it appears that female occupational movers are increasingly more likely to work in sex-atypical occupations than they were before, how long do they last in them in comparison with men? Likewise, are the women who join the labour market via female occupations after a break for childrearing trapped in these mostly low-paid and low-status occupations? Or do they also experience occupational mobility across sex types as their colleagues in continuous employment do?

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Contact details of the authors

Daniel Guinea-Martin, formerly of the Longitudinal Study Unit, Office for National Statistics, 1 Drummond Gate, London SW1V 2QQ. www.statistics.gov.uk/ls
Currently at the Spanish Advanced Centre for Scientific Research, Albasanz 26-28, Madrid 28037, Spain.
Email: daniel.guinea@iesam.csic.es
Web: http://www.iesam.csic.es

Jane Elliott, Centre for Longitudinal Studies, Institute of Education, 20 Bedford Way, London, WC1H 0AL.
Email: J.Elliott@ioe.ac.uk
Web: http://www.cls.ioe.ac.uk