

Stratification and Gender

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Abstract

The existence and extent of occupational gender segregation is well known. This is commonly taken as an indication of gender inequality, but this is incorrect. In general the more egalitarian countries, in terms of gender, tend to have higher levels of gender segregation. To understand this we must appreciate that occupational gender segregation is the resultant of two components, a vertical dimension which does measure gender inequality, and a horizontal component that measures difference without inequality.

The vertical dimension measures the extent of advantage/disadvantage of men compared to women in the stratification structure. The structural inequalities of social stratification are usually understood by sociologists as being represented in a stratification scale, and the most useful scale for analysing gender segregation (or any structure of occupational inequality) is CAMSIS. This measures the general desirability of occupations and so includes the inequalities traditionally conceived as class and status. However, economists and the general public are more likely to see occupational inequality in terms of income from wages and salaries. Although income is only one aspect of occupational attractiveness it is an important one, and tends to be quite well related to other aspects of occupational attractiveness.

The paper considers these two stratification measures of vertical segregation, and their contributions to the resultant (of vertical and horizontal segregation) overall segregation. The main countries considered are the USA and Britain. The analysis shows the expected male advantage on income, though rather less than some might expect. In terms of occupations' general attractiveness (CAMSIS) the situation does not display the 'expected' male advantage. The explanation of the observed patterns is then considered.

1 Introduction

In all countries there is a degree of differentiation in the occupations of men and women. Nowhere is this occupational gender segregation complete, and the extent varies from country to country. Nevertheless, the degree of segregation is often substantial, particularly in the more industrially developed countries. Also the occupational structures of all countries are stratified, with economic success of a country tending to accompany high levels of social and economic inequality. This raises the question of the relationship between gender segregation and occupational stratification. If men and women tend to be concentrated in different jobs, do men or women tend to have the better jobs, or is the gender distribution random throughout the stratification hierarchy?

In general the question has been answered consistently and confidently; men have the better occupations and women are disadvantaged. Indeed gender segregation has frequently been taken as a measure of gender inequality, or at least as being closely related to, and a strong indicator of inequality (eg Bradley 1989, Reskin and Roos 1990, Walby 1997, Yamagata et al 1997). However, on closer inspection, the situation appears less clear cut and somewhat puzzling. We shall explain why this is so, but to avoid confusion we need to be precise in the definition of our terms.

The basic idea of gender segregation is the tendency for men and women to be employed in different occupations. Frequently the concept has been used in a broad sense to include both *segregation* in the precise sense which we employ and *concentration* (e.g. Armstrong and Armstrong 1978, Lewis 1985, Anker 1998). Certainly the concepts are related but for the analysis which we are presenting they have to be distinguished. The analysis is only possible with the precise conception of segregation.

Concentration refers to the extent to which one sex is concentrated in a particular occupation or group of occupations. That is, it measures the gender composition of the workforce in the occupation(s) concerned, usually measured as the percentage of the workforce who are women. Segregation, on the other hand, measures the degree to which men and women are employed in different occupations from each other within the entire labour force or the section of the labour force under consideration (eg full-time workers). An important feature of segregation is that it is gender symmetrical: in so far as women are separated from men in employment, so are men equally separate from women. This is an important difference from concentration, which logically cannot be symmetrical, apart from the limiting situation where the workers in an occupation are exactly 50% women and 50% men. Thus we see that while concentration refers to the representation of *one sex within* occupations, segregation refers to the separation of the *two sexes across* occupations (Siltanen et al 1995: 4-5).

In both segregation and concentration we are concerned with the distribution of women and men in occupation. This is the reality behind the practice of lumping together concentration and segregation (in the narrower, more precise sense) in a single concept of segregation. Indeed, segregation may be seen as the resultant outcome, in the labour market under consideration, of the levels of concentration in all the separate occupations making up the labour market. In fact the traditional way of measuring segregation was the sum of separate terms, reflecting concentration, over all the occupations in the labour market. This is how the Index of Dissimilarity (ID), the most popular segregation measure, used to be measured. However, it is far simpler to see ID as a straight-forward difference of proportions in the 2 x

2 Basic Segregation Table, and most other segregation measures can similarly be related to this table (see e.g. Blackburn et al 1990, 1993, Siltanen et al 1995, Blackburn and Jarman 1997).

There is a tendency for occupations to polarise into those with high female concentrations and those with high male concentrations - diagonal cells of the Basic Segregation Table (Boyd et al 1991, Jarman et al 1999). It is the extent of this polarisation that is measured in segregation values.

For present purposes, rather than using ID we shall be using MM_{200} and O_{200} (Blackburn et al 2000, 2001a). Like ID they have a potential range from 0 to 1. The subscript indicates that the measures have been standardised on 200 occupations¹. This is done because all segregation measures tend to increase with the number of occupations in the classification scheme. The number 200 is chosen as being roughly central to the various national schemes of occupational classification. More importantly, the effect on measured segregation of increasing the number of occupations declines substantially by 200 occupations and the potential error component is relatively small. Where the number of occupational categories in a scheme is small, say less than 20, the error component in the segregation measure can be misleadingly large, but no country with such a scheme is included in the present analysis.

MM , unstandardised, is similar to ID in that it is based on a dichotomy between ‘male’ and ‘female’ occupations, with definitions - as we would expect - based on the relative proportions of men and women in the occupations. However, MM is based on a different definition of the dividing point between male and female occupations. If we think of occupations ordered from those with the highest proportion of women to those with the lowest, ID uses the proportion of the labour force who are women as the dividing point, with all occupations with greater proportions of women being classed as ‘female’. MM uses the point where the total number of workers equals the number of women in the labour force, so that the marginal totals of a Segregation Table match, as they do for ID in, but only in, a

¹ The standardised value of MM is derived in the following manner.

If MM_{ni} is the observed value of MM in country i where the data set has n occupations and MM_{nE} is the expected value for n occupations, we estimate

$$MM_{200i} = MM_{200E} \times MM_{ni} / MM_{nE}$$

MM_{nE} is estimated from the formula:

$$MM_{nE} = 1 - \frac{1}{1 + 0.6(\log_{10}n)^{0.93}}$$

This gives a value for MM_{200E} of 0.56567.

For country i with n occupations the standardised value of O is given by:

$$O_{200i} = O_{200E} \times O_{ni} / O_{nE}$$

The expected value for n occupations, O_{nE} , is given by:

$$O_{nE} = 1 - \frac{1}{1 + 2(\log_{10}n)^{0.73}}$$

This gives a value for O_{200E} of 0.78609.

situation of total segregation. This marginal matching overcomes a weakness of ID where the relative size of the marginal totals influences the observed value of the segregation measure (Siltanen et al 1995, Blackburn et al 1993, 1995).

The unstandardised O is the Gini Coefficient, as used by Silber (1989, 1992) and Lampard (1994). It has a disadvantage compared to MM or ID in that it over-weights the occupations with more extreme inequalities of gender composition (Blackburn et al 1994). However, as we shall see, there are important advantages in using a continuous measure rather than a dichotomy when addressing issues of inequality, and then the advantages of the gini coefficient outweigh the disadvantages (Blackburn et al 2001a). Firstly we need to consider an unexpected finding and how it may be explained.

2 Puzzling patterns

A major reason for the interest in gender segregation is a concern with gender inequality. To a large extent, as we noted earlier, it has been assumed that the measurement of segregation is an indicator, if not a direct measurement of gender inequality, with the inequality working to the disadvantage of women. In terms of stratification, occupational segregation places women in lower levels of the stratification hierarchy. However, when we examine the levels of segregation in a sample of industrially developed countries² we find a very different pattern (Blackburn et al 2000).

Considering the position of women in terms of equality in the public sphere and the levels of occupational segregation we find a situation which is almost the direct opposite of what we might expect on the basis of conventional views of gender segregation. Table 1 presents the correlations of MM₂₀₀ with three United Nations measures: the Gender Related Development Index (GDI), the Gender Empowerment Measure (GEM) which is actually a measure of women's empowerment, and the Human Development Index (HDI)³. The first thing to note is that all the correlations are positive, and for the GDI and GEM they are highly significant statistically, despite the small number of countries. The GDI and GEM are direct measures of women's economic achievement and empowerment, and so we would expect them to be related to segregation. The HDI has no gender element and so no direct reason to be related to the segregation level, but as countries with high levels of HDI tend to have strong feminist movements and to have enacted legislation to promote gender equality, we might expect some relation with segregation. For all three measures we would expect the correlations to be negative and for the GDI and GEM to be strong, high empowerment removing the female disadvantage of segregation. Yet we see that this is the very opposite of what we observe: the

² The countries, with MM₂₀₀ values, are Sweden (.683), Finland (.623), Canada (.604), Norway (.601), UK (.595), Australia (.566), Switzerland (.557), France (.552), USA (.548), Spain (.538), New Zealand (.512), Poland (.500), Japan (.443) and Italy (.424).

³ The correlation coefficients in Table 1 are Spearman's rho because of the distribution of values, though the results would be essentially the same if Pearson's product-moment correlations were used.

greater the level of segregation, the greater tends to be the empowerment and general social advantage of women.

Table 1: Association between segregation, MM_{200} , and measures of national social development and gender equality: Industrialised Countries

	Human Development Index (HDI)	Gender-Related Development Index (GDI)	Gender Empowerment Measure (GEM)
MM_{200}	0.284	0.618	0.603
Sig.	0.143	0.005	0.007
N	16	16	16

Before we conclude that, after all, it is men who are disadvantaged in occupational segregation, we need to take account of one further piece of crucial evidence. In no country for which the UN has data, including the 16 considered here, do the levels of GEM and GDI reach unity. They are measures of the extent to which the situation in each country approached equality in the public sphere, with 1 representing equality. The approach towards equality tends to be greater in the more segregated countries, but everywhere there is inequality and segregation.

Nevertheless the puzzle is real. How can it be that, contrary to expectations and assumptions, higher segregation tends to go with less inequality. To understand this we must first take our conceptualisation of segregation a step further by introducing the vertical and horizontal dimensions of segregation.

3 Stratification and Equality

It is necessary to appreciate that gender segregation is not necessarily related to social inequality. In reality it is related, as evidenced by the ubiquitous levels below unity of the GEM and GDI. However, the inequality need not be a major aspect of the segregation. Also, there are different ways in which inequality can be conceptualised and measured, and they can contribute differently to the level of segregation.

The fundamental point to recognise is that segregation can be decomposed into *vertical* and *horizontal* dimensions. We use the terms vertical and horizontal in the usual mathematical sense to represent two orthogonal dimensions. The vertical dimension measures inequality while the horizontal dimension measures difference without inequality. The resultant of the vertical and horizontal dimensions is segregation as it has generally been conceived, which we now call *overall* segregation to avoid confusion, though we will continue to use the simple term *segregation* when the meaning is perfectly clear.

Since the terms horizontal and vertical have been used for some time in the segregation literature we must stress that we are *not* following this tradition; we use the terms with their mathematical/common-sense meanings. Most importantly we reject the use of ‘horizontal’ to

refer to overall segregation (eg. Hakim 1979, Moore 1985, Crompton and Sanderson 1990, Cousins 1999, Palomba 2002). For the most part the simple term ‘segregation’ has been used, but the qualifying label ‘horizontal’ has been employed to distinguish it from vertical segregation (just as we have used the label ‘overall’). Not only does this ‘horizontal’ measure contain a vertical component but, as we have seen, it is often treated as a measure on inequality - a sure recipe for confusion.

Vertical segregation, as introduced by Hakim (1979), was not a single dimension but a set of dimensions for a range of situations, eg. hospital doctors are above nurses and head teachers are above teachers, but there is no vertical relation between doctors and teachers. In our approach the vertical dimension is a measure of stratification covering all occupations. Quite simply, the vertical and horizontal dimensions represent stratification and equality respectively.

Figure 1 The Dimensions of Segregation

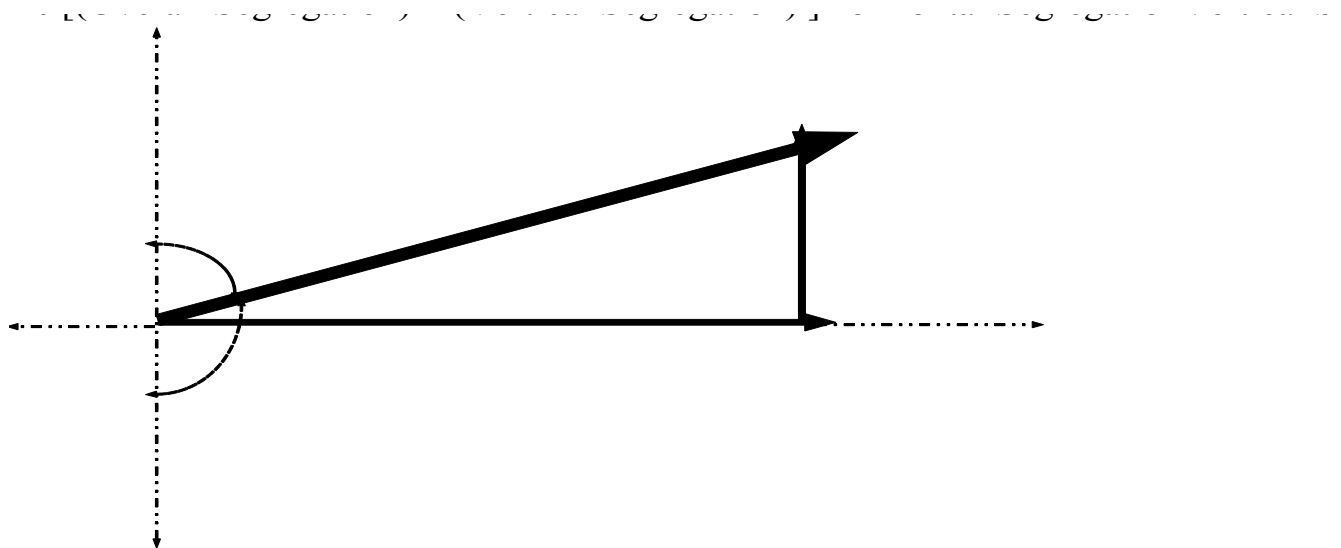


Figure 1 illustrates the relations between overall segregation and its components and indicates how they are measured. The figure illustrates a situation where all the measures are positive and the resultant lies in quadrant A. This we take to indicate the familiar and widely assumed situation of male advantage. In particular the vertical component is positive. However, it is possible for the vertical component to be negative, indicating female advantage. Since the horizontal measure does not contain an element of advantage, it is a scalar quantity and can only be positive. Thus segregation cannot lie in quadrants C and D, and female advantage places the resultant overall segregation in quadrant B, where convention makes it negative along with the vertical component.

At this point we have to change our measurement of overall segregation. While we were concerned solely with overall segregation a dichotomous measure was fine because a dichotomy measure, as a measure internal to the data, takes full account of degrees of concentration (Blackburn *et al.* 2001a). However, when we measure vertical segregation we introduce an external criterion, such as stratification, to measure inequality. This means that a dichotomy would suppress essential information (inequalities would be condensed into two groups), so a continuous measure is appropriate. For this we use Somers' D, and clearly it is now appropriate, indeed essential, to use the corresponding continuous measure for overall segregation, which we have shown to be the Gini Coefficient (Blackburn *et al.* 1994, 2001a). As noted earlier, it is necessary to standardise the Gini Coefficient as O_{200} , and similarly we need to standardise the vertical dimension as V_{200} ⁴. While there is no way that we are aware of to measure the horizontal component, we may calculate it, using Pythagoras' theorem, as $H_{200} = (O_{200}^2 - V_{200}^2)^{-}$.

There are very many forms of difference among members of a society, but only if they are socially valued do they become bases of inequality. In the contemporary world, for example, expertise in singing pop songs or running a marathon may be highly rewarded, but this was not always so. Where activities are valued they tend to be or become occupations, and in the modern world work in an occupation is recompensed with pay. Therefore pay is *the* fundamental economic reward associated with occupations. Accordingly we take pay to be the essential economic vertical dimension of occupational segregation⁵. However, pay is not the only reward associated with occupations; there are various social advantages and disadvantages. For instance there is the status or prestige, the power, the intrinsic interest of the work, and the social and physical environment. In order to capture the general social desirability of occupations in a single measure we use CAMSIS⁶ (Bottero and Prandy 2003, Prandy and Lambert 2003). This is a particularly useful measure as it relates better to relevant variables than do conventional measures of class and status. Because Somers' D and the Gini Coefficient are ordinal measures, CAMSIS and income have to be ordinal; this has little relevance for CAMSIS but has the advantage of reducing the extreme skewness of the income distribution.

4 Resolving the Puzzle

We are now in a position to resolve the puzzle of the level of gender segregation being positively related to gender equality, instead of negatively related, although the solution is still not completely obvious or straight-forward. Since overall segregation is not itself a

⁴ The standardisation of V depends on the level of overall segregation as well as the observed value of V. The formula is

$$V_{200} = V_n[1 - V_n(O_n - O_{200})/O_n^2] \quad \text{where } n \text{ is the observed number of occupations.}$$

⁵ Wealth is also a major form of economic differentiation, but is not directly related to occupations, so does not concern us here.

⁶ Formerly known as the Cambridge Scale when applied only to Britain, but now applied to numerous countries (eg. Prandy and Jones 2001).

measure of gender inequality, it is not necessary for it to be related to the degree of gender inequality in a society. It is the vertical dimension, and only the vertical dimension, which must vary with the extent of gender inequality. The expected negative correlation of measures such as GEM and the GDI should be with the vertical dimension of segregation. However, overall segregation does contain an element of vertical inequality, so it would still be reasonable to expect some degree of negative association. Instead of this we find substantial positive relations. So the question remains, 'why?'

We would certainly expect the two components of segregation to vary together with overall segregation. Indeed, to some extent this is inevitable, as neither component can be greater than their combined resultant, overall segregation. Where the level of overall segregation is particularly low, as in Ethiopia ($MM_{200} = 0.1130$) or Rwanda ($MM_{200} = 0.118$)⁷ there is little scope for a vertical dimension, whereas in countries such as the USA ($MM_{200} = 0.548$) and Switzerland ($MM_{200} = 0.557$), let alone Sweden ($MM_{200} = 0.683$), the scope for a large vertical dimension is very much greater. This reinforces the puzzle.

However, there is another, less obvious tendency which may be operating. Vertical segregation may vary inversely with horizontal segregation, and so to some extent with overall segregation. For any given level of overall segregation it is, of course, logically necessary that any variations in the vertical and horizontal components should be inversely related. However, beyond this there may be a tendency as overall segregation varies for this to have opposing effects on the components, with high overall segregation accompanying a high horizontal component and a relatively low vertical one.

With two conflicting trends it may seem anything or nothing can be explained. Yet the situation is not so bad. Over the whole range of overall segregation values⁸, which is more than 80% of the highest observed value, the decisive factor will tend to be the maximum potential value of the vertical component. The first pattern, where overall and vertical segregation vary together will tend to dominate, though the relationship will not be perfect. On the other hand, among the industrially developed countries, where overall segregation tends to be quite high, the range of overall segregation values is much smaller. In our sample of 16 countries the range is only 38% of the maximum, and if we exclude the 3 outlying extremes at top and bottom of the range (Sweden, Japan and Italy) the range is less than 20%. In this case it is possible for the second trend to dominate, with vertical and overall segregation inversely related, though by no means overwhelmingly so. This appears to be the situation we found, with positive correlations between overall segregation and both the GEM and the GDI; the correlations are substantial yet - in their product-moment form - they account for less than half the variance.

This may explain why the inverse relation is possible but it still remains for us to explain why it occurs. Why should high overall gender segregation tend to be accompanied by relatively

⁷Data from United Nations (1996). As the measures are based on only 7 occupational categories there is considerable scope for error in these examples, but the basic point remains valid.

⁸ For 161 countries, using UN and ILO data.

low gender inequality? The answer lies in the effect of segregation in a fundamentally unequal society. The first point to recognise is the existence of competition for good jobs. Given that each society is occupationally stratified, there is inbuilt competition for the higher level jobs. This does not exist in the form of all-out competition with everyone striving for the best jobs; the competition is itself stratified. Within the range of potential jobs, each worker tends to avoid the less attractive and choose the 'better' jobs. So far as possible, workers generally seek the occupations which are more attractive in general terms - higher CAMSIS scores - and which offer higher pay. There may have to be some trade off, but both are seen as desirable and they tend to vary together.

At the same time, if occupational segregation exists, whether on the basis of ethnicity, gender or anything else, it is liable to result in inequality in the occupational distribution. Certainly, women's disadvantage does exist. This is not always due to explicit discrimination. In the normal processes of social reproduction, as more women have entered the labour market they have tended to go into expanding occupations where vacancies existed, such as clerical work and more recently the professions. University teaching provides a familiar example where an expanding occupation has seen an increasing proportion of women staff and a declining level of pay (Blackburn et al 2002). Whatever the particular reasons, competition in the labour market does tend to disadvantage women.

Segregation, however, may tend to *reduce* competition, and so benefit women. In so far as a career structure is dominated by one sex, then that sex will tend to fill the senior positions. Where women do not have to compete with men there can be no appointments made on the basis of gender. Regardless of whether men tend to get the senior jobs because of better qualifications, more experience⁹, greater commitment to promotion, fewer time conflicts between family and work responsibilities, or just plain sexist discrimination, in so far as they are not available the jobs have to be filled by women. With total horizontal segregation there would be no vertical segregation. Such a clear-cut extreme does not exist, and where men are a minority in an occupation they may gain a disproportionately large share of promotions, as tends to happen, for example, in nursing and teaching. Nevertheless, the greater the level of segregation means the fewer the available men in female occupations, and so the more women have to fill the promoted positions. Furthermore, if the most advantaged men in terms of career prospects (by social background, education and social connections) are largely concentrated in male-dominated occupations, the competition from men in other occupations is less strong. In so far as those making appointments exercise any gender bias in favour of their own sex, the prospects for both men and women are better if they follow conventionally gendered occupations. High horizontal segregation has the disadvantage that it limits occupational choice for both women and men; but it also tends to restrict vertical segregation.

At the same time the classic process of movement from ascription to achievement in occupational appointments may tend to reduce vertical segregation. The women's movement

⁹ There has been a vast expansion of higher education for women, but in the oldest age groups, which still tend to fill the most senior positions, men are more likely than women to have qualifications. There are also more men in employment at the oldest ages, and the effect of taking time out of employment to raise children reduces the work experience of many women.

has undoubtedly had an influence here, leading organisations to examine their promotion practices and to place more emphasis on credentials and performance tests. In many countries there has been a very substantial increase in women's participation in higher education, which has assisted women in making inroads into formerly elite male occupations (Shavit and Blossfeld 1993, Blackburn and Jarman 1993). On the other hand the elite, particularly upper-class males, have many social resources to maintain their advantages.

5 Some Empirical Evidence

We have seen that the theoretical argument fits the data we have considered so far. It would, however, be desirable to test it thoroughly with further empirical evidence. Unfortunately we do not, as yet, have the data for a complete test. We do, nevertheless, have some relevant data which is consistent with the argument.

As noted earlier, the most useful vertical measures are pay - the basic economic reward - and CAMSIS, which measures the general attractiveness of occupations. The two measures are quite well related, as we would expect, eg. for Britain about half the variance is common. Nevertheless the two measures give quite different results. It is impossible for just two measures, separately or combined in one measure, to provide a complete coverage of occupational inequality, but they are adequate to give a usefully instructive picture.

Looking at the segregation patterns in Table 2, for Canada, Britain and the USA (for a longer time period as recent census data are available) when the vertical dimension is measured by pay, we see the expected result of positive values on the vertical dimension, indicating female disadvantage. For Canada and the USA pay is measured as the mean pay of all workers in an occupation, but for Britain it is measured by that of men (since the data quality for women's pay is poor). Thus the pay dimension measures gender differences due to segregation, as intended, without taking account of further differences within occupations.

**Table 2 Dimensions of Segregation Canada, Britain and the USA
Vertical Dimension measured by Pay**

Segregation	Canada		Britain		USA	
	1991	1996	1991	1996	1990	2000
Overall (O₂₀₀)	.689	.692	.771	.761	.686	.668
Vertical (V₂₀₀)	.309	.268	.276	.289	.309	.253
Horizontal (H₂₀₀)	.616	.638	.720	.704	.612	.618
N of Occupations	512	514	371	371	504	509

Source Data: Canadian Census, supplied by Statistics Canada; British Labour Force Survey and New Earnings Survey; and IPUMS US Census data. For the USA and Canada income estimates are based on the pay of men and women; for Britain estimates are based on male earnings.

It is worth noting that the vertical dimension is substantially less than the horizontal one. To some extent this is due to using an ordinal scale of income, since the actual income

distribution is skewed with a long tail at high levels, with men dominating the very high levels. On the other hand, this gives a realistic result for the majority of the population. Stratification within each gender is greater than stratification between them when the measure of stratification is occupational income¹⁰. Ironically, this is, at least in part, due to the success of feminism in reducing the difference between men and women in countries where men's occupational income is highly stratified.

In each country the change over time is in keeping with the predicted pattern; horizontal and vertical segregation changed in opposite directions. In the USA and Canada the horizontal component increased while the vertical segregation declined, while in Britain the pattern of change was the reverse. In Canada and Britain overall segregation changed with horizontal segregation, that is, in the opposite direction from vertical segregation. In the USA, however, the fairly substantial decline in vertical segregation was accompanied by a smaller decline in overall segregation, which is also in keeping with our general argument, though not with the pattern of the puzzle.

In order to keep the occupational classifications comparable we only have a short time period and the changes are quite small. Looking back to earlier years for Canada and Britain, the comparisons may not be so reliable but the basic pattern seems clear; in both countries there were very strong moves towards equality along with more moderate increases in horizontal segregation, resulting in modest declines in overall segregation. In Canada from 1981 to 1991 the vertical component declined 31.9% from 0.454 while the horizontal component increased only 2.5% from 0.601 with the result, as we might expect, that overall segregation declined by 8.5% from 0.753 (Brooks et al 2003: 205). In Britain the changes from 1991 to 1996 reversed an earlier trend; from 1971 to 1991 the vertical component saw a substantial decline of about 42% while the horizontal component increased by about 10%. Again the large decline in vertical segregation with only a small increase in the horizontal component led to a modest reduction in overall segregation, of roughly 4%. Despite the contrary trend in Britain from 1991 to 1996, there has been a general movement towards gender equality in all three countries, and despite modest increases in horizontal segregation, the net effect over time has been a slight reduction of overall segregation.

When we make comparisons among countries the results are less clear. In 1990/91 there is virtually no difference between Canada and the USA, while Britain had higher horizontal and overall segregation coupled with lower vertical segregation, in keeping with our expectations. However, the changes to 1996/2000 remove the pattern, placing Britain with the highest values on all three measures and the USA with the lowest. It is worth noting, nevertheless, that if we interpolate an estimate for the USA in 1996 the comparison with Canada does fit the pattern. Bearing in mind that the tendency observed in Table 1 was far from complete, these findings within and between countries fit the predicted pattern at least as well, if not better than, expected.

¹⁰ This does not take account of inequality within occupations, whether due to the women being younger, having less work experience, working less hours or suffering discrimination. Thus the stratification inequality is less than the total gender inequality.

Turning to the patterns of segregation using CAMSIS as the measure of occupational inequality, Table 3 presents results for Britain in 1991 and 1996 and the USA for 1990¹¹.

**Table 3 Segregation in Britain, 1991 -1996, and USA 1990
Vertical Dimension Measured by CAMSIS**

Segregation	Britain		USA
	1991	1996	1990
Overall (G₂₀₀)	-.778	-.768	-.686
Vertical (V₂₀₀)	-.124	-.118	-.140
Horizontal (H₂₀₀)	.768	.759	.671
N of occupations	371	371	504

Source: British census 1991 and the 1996 Labour Force Survey adjusted by the ratio of values for the 1991 census to the 1991 Labour Force Survey; IPUMS for US census data, and CAMSIS website at Cardiff University.

Overall segregation is shown as negative as it lies below the horizontal in Figure 1 like the vertical segregation which is negative. Horizontal segregation is a scalar quantity, showing no advantage to either sex, and so can only be positive.

The first thing to note is the set of negative values, indicating that occupational advantage lies with women¹². This may not fit conventional views of segregation, and some may even find it surprising, yet it should not surprise. Long ago England (1979) and Fox and Suschnigg (1989) found similar results using prestige scales for the USA and Canada. Admittedly England and Fox and Suschnigg were simply comparing gender scores on the scales, rather than measuring a vertical dimension of segregation, but the implication for segregation is there. Reluctance to accept such a result led Fox and Suschnigg (1989: 358) to reject the value of prestige scales, remarking ‘We believe (with England, 1979) ... that the concept should be removed from its central role in research on stratification’. While we would not particularly wish to defend prestige scales, our findings do indicate that this pattern of inequality is real and needs to be taken seriously. At the same time we must not lose sight of the fact that this is only one aspect of gender inequality, and as we have seen, the complete picture of gender segregation shows a real (if less than often believed) disadvantage for women. One aspect not directly covered by either of our measures is power, which is hard to measure but, as we would expect, does tend to favour men (Wright et al 1995).

The vertical components are quite small, and the change in Britain is small. If we look back to 1971 the vertical component has changed little, being -0.123 then, while there has been a modest decline in the magnitude (ignoring sign) of overall segregation and its horizontal component (from 0.809 and 0.800 respectively). Even if we assume the negative element is measurement error and the vertical values should be zero, they are still much less than the

¹¹ 2000 values are not yet available.

¹²Using the Standard International Occupational Prestige Scale (SIOPS) to measure vertical segregation in Greece, Vaiou found the vertical dimension was positive (0.110) though it was negative for manual workers (-0.106) (Blackburn et al 2001b).

values for income. In fact, as CAMSIS is positively correlated with income, it appears that in so far as aspects of CAMSIS inequality are unrelated to income, they give a clear advantage to women.

To understand this negative finding we need to see how men and women are distributed through the occupational structure. Men may dominate the best occupations, particularly the most highly paid ones as we noted earlier, and this has received plenty of attention. However, at the other end of the scale, work, and particularly unskilled heavy labouring (which may be moderately well compensated in pay) is also more likely to be done by men. Women tend to be concentrated towards the middle of the scale, in non-manual work, though disproportionately at the lower levels. Thus the vertical dimension is negative for manual work and positive for non-manual work (Blackburn et al 2001a: 523). The net result is the slight advantage to women which we have observed.

Turning to our basic concern, the relation between the horizontal and vertical dimensions, we face a difficulty. How are we to interpret negative values? We have argued that greater overall segregation tends to reduce gender inequality. This would imply that we ignore the sign and hypothesise that horizontal segregation tends to vary inversely with the numerical magnitude of the vertical component. On the other hand, if high overall segregation tends to reduce the vertical component to values close to zero, the deviation from zero can be in either the positive or negative direction. In fact differences in the vertical measures are so small as to make any conclusion difficult. The clearest difference is that between the USA and Britain, which fits the first interpretation - ignoring sign - which we are inclined to accept. On the other hand, the tiny vertical change in Britain fits the alternative interpretation. In any case the findings do not contradict our argument of two opposite tendencies, but they do not lend strong support either.

The only firm conclusions we can draw from the CAMSIS data is that overall segregation is clearly not a measure of gender inequality (in either direction) and - in keeping with our general argument - differences in vertical segregation, over time or across countries, do not necessarily follow the same pattern as differences in overall segregation.

6 Conclusion

To understand the relation of gender segregation and occupational stratification we need clear and precise conceptualisation and definitions. Segregation measures the extent of the polarisation of men and women into different occupations. It must be distinguished from concentration or proper analysis becomes impossible, and it must be standardised to control for the differing number of categories in occupational classifications.

It is essential to recognise that segregation, as traditionally understood, is not a measure of gender inequality. The treatment of it as a measure, or an indicator, of inequality led to the puzzle of significant positive correlations between segregation and levels of women's empowerment and general social advantage for women. To understand the puzzle it is necessary to recognise that segregation has vertical and horizontal components, where vertical segregation measures inequality in terms of stratification while horizontal segregation measures difference without inequality. To avoid confusion, we renamed the resultant segregation as overall segregation. To avoid the confusion stemming from the common

practice of labelling overall segregation as horizontal, we stress that the vertical and horizontal components are orthogonal.

While women are disadvantaged in the occupational sphere in all countries, the gender inequalities of segregation are less than the inequalities among women or among men. This is so even in relation to income, where the gender inequalities are substantial. With respect to the social advantages of occupations, as measured by CAMSIS, women are not disadvantaged and may even be slightly advantaged, at least in some industrially developed countries.

The relation between stratification and segregation is complex. On the one hand there is a necessary positive relation. As overall segregation increases or decreases, the level of vertical segregation must tend to vary accordingly, as must horizontal segregation; or looking at it the other way round, changes in vertical segregation must tend to produce corresponding changes in overall segregation. At the same time there is a tendency for horizontal and vertical segregation to vary inversely which is more than the logically necessary pattern for a given level of overall segregation. Regardless of how overall segregation changes, only one of the components changes in the same direction. This appears to be the dominant trend among industrially developed countries, being born out by our limited empirical testing. On the whole it seems that overall and horizontal segregation tend to vary together while the vertical, stratification component does the opposite. This pattern provides the solution to our puzzle. The greater the horizontal and overall segregation, the less the competition between men and women for senior jobs and so the less scope for gender discrimination. This then tends to create two separate stratification hierarchies for men and women, and so greater gender equality, that is, a lower level of vertical segregation.

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