Gender and the Ethnic Differences in Education and the Youth labour market

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ABSTRACT

This paper reviews recent findings on gender and ethnic differences in education and the youth labour market from the GCSE stage at 16 to age 24. It uses large nationally representative data sets, presents recent trends and relates these to debates about racial discrimination in the labour market and the supposed educational under-achievement of ethnic minority young people. It also presents a critique of such work by setting out the desirable characteristics of a large and complex data set. Statistical model building is given particular scrutiny and the studies discussed in relation to criteria for evaluating such models.

1. INTRODUCTION

This paper reviews recent findings on gender and ethnic differences in education and the youth labour market from the GCSE stage at 16 onwards. It focuses on large nationally representative data sets, presents recent trends and relates these to current debates. It also presents a critique of such work by setting out what are desirable characteristics in a large and complex data set. Statistical model building is given particular scrutiny and the studies discussed in relation to criteria for evaluating such models.

Two sets of introductory remarks need to be made; the first about the current debates and literature surrounding the area and the second about a framework for judging the statistical studies that will be discussed.

Analysing statistical data is about trying to reflect current debates. There are a number of current debates and areas of the literature which impinge on the present discussion. One of the debates is about the supposed educational underachievement of ethnic minority young people (Swann, 1985). Another debate is about the extent of racial discrimination in the labour market (Brown, 1984; Brown and Gay, 1985 and Brown, 1992).

Recent attention has turned to interrelationships between ethnicity, gender and social class (Goldstein, 1993) so this draws on literature about gender (Wilson, 1978) and social class (Heath and Clifford, 1990; Paterson, 1992 and Burnhill, Garner and McPherson, 1990). The 1991 Census has resulted in a considerable volume of analysis on ethnic differences relative to social geography and place as well as education and employment (Forrest and Gordon, 1993; Owen, 1992, 1993; Rees, Phillips and Medway, 1993; Simpson,1993; West Midlands Low Pay

Unit, 1993 and Ballard et al., 1994). Another issue is about findings in other countries and whether what is happening here relates to what is happening in other places particularly, say, in the United States. This relates both to current debates about 'race' and class (Wilson, 1987) and to current research in the United States on 'race' and gender inequalities (see Lee and Smith, 1989 and Schau et al, 1992 on gender inequality, Thomas, 1993, Myers, 1993 and Lobo, 1993 on racial inequality). Finally, there is a continuing discussion about the ways in which quantitative and qualitative research can complement each other in this particular area of research (Mac an Ghaill, 1988; Gillborn, 1990; Gillborn and Drew, 1992 and 1993; and Fitzgerald, 1993).

To summarise; debates about educational underachievement, racism and racial discrimination, the interrelationship between 'race', gender and class, and qualitative and quantitative research all provide a backdrop for discussion. We will focus specifically on statistical studies on education and the youth labour market with this backdrop in mind.

No data source is ideal but it is perhaps appropriate at this stage to set out what would be a set of desirable characteristics for a survey in this area. The survey should have a large sample size, be nationally representative, have a high response rate, be longitudinal so that progress can be measured, measure ethnicity in an appropriate way, measure other appropriate control variables in appropriate ways, be a continuing survey so that comparisons can be made over time and make multilevel analyses possible.

Three major government funded surveys fulfil most of these criteria; the Youth Cohort Study of England and Wales (YCS), the Labour Force Survey (LFS) and the 1991 Population Census with its associated Sample of Anonymised Records (the SARs). The strength of the YCS is that it has been a nationally representative longitudinal survey of 16-19 year olds since 1984 and has currently about 15,000 respondents in each cohort. The LFS has an annual sample of 60,000 but this covers the whole age range so the number in the 16-24 age group is much smaller than this. The Census SARs, are a 2 percent sample of individuals and a 1 percent sample of households, a sample of over a million in the first case and over half a million in the second, so the sample size is very large and the analysis potential of the data is quite considerable.

For all three studies differential nonresponse is potentially a problem and the implications of this for the Census have yet to be explored. The three surveys also differ in the questions they use about educational qualifications. Appropriate controls for educational attainment are crucial for an understanding of the transition from school to work. In this respect data from the Population Census is somewhat limited as will be discussed later. In the next section we will discuss ethnic differences in educational attainment. This is then related, in the following section, to the probability of success in the labour market, having controlled for educational attainment (and other characteristics). Some questions are then raised about the strengths and weaknesses of such model building exercises.

2. EDUCATIONAL ATTAINMENT

In this section we discuss findings from the YCS, the LFS and the 1991 Population Census. The educational attainment of Afro-Caribbean and Asian

young people at the GCSE stage and in post-compulsory education has been analysed and discussed in the YCS (Drew and Gray, 1990; Drew, Gray and Sime, 1992) and discussed in the context of other studies (Drew and Gray, 1991). It was possible in this study to focus on attainment at 16, the decision to stay on at school and college, the progress of those re-taking GCSE courses, taking vocational qualifications and taking A levels and the overall outcomes at the age of 19.

The conclusions were that at the GCSE stage, Asians were on a par with white young people and Afro-Caribbeans as a group, somewhat lagged behind. The staying on rates were much higher for the ethnic minority groups relative to the whites. As a result, at 18, Asians were better qualified than white young people at A level and Afro-Caribbeans, as a group somewhat lagged behind still in A level qualifications but were better qualified in terms of vocational qualifications than all the other groups.

Whilst at the GCSE stage girls generally do better than boys on average, gender differences were not particularly apparent for the Afro-Caribbean group as might have been expected from other studies. Part of this may have been due to the Afro-Caribbean group being a combination of the group describing itself as African with the group describing itself as Caribbean.

At the age of 16 social class differences were larger than ethnic differences and in the analysis comparisons between ethnic, social class and gender groups both separately and together were made. This showed for example that Afro-Caribbean boys from working class backgrounds were lagging behind their counterparts in two senses; they lagged behind other working class boys and they lagged behind Afro-Caribbean working class girls. What was also apparent was that there was considerable variability within the Afro-Caribbean and Asian groups so that to describe one particular group as underachieving was an oversimplification.

One purpose of the analysis of ethnic differences is to establish how large a gap there is between groups. A second, rather more difficult task is to find explanations for these differences and we have discussed this problem and the findings of a decade of research studies elsewhere (Drew and Gray, 1991). In some senses the most promising recent development has been in the use of multilevel models. However, we believe the finding by Smith and Tomlinson (1989) that school differences are more important than ethnic differences is at least premature and is weakened by the limitations of their own study (see Gillborn and Drew, 1992). The multilevel study by Nuttall and Goldstein et al (1989) from a much larger survey reaches rather different conclusions, and more work is needed in this area.

New results are now becoming available for the Census. The main limitations of these data is that the Census categorisation of qualification is by highest qualifications obtained, diploma level, degree level and postgraduate level. With less than one in ten of the population in the 18-24 year age group reaching this level of attainment it provides only a partial view of the full spectrum of attainment (Figure 1). Since it is unusual to obtain a degree before the age of 21 the percentages in this figure are a better indication of ethnic differences than absolute levels of attainment. The level of attainment of the Pakistani, Bangladeshi and Black Caribbean groups is lower than that of the white group, whilst the attainment of the Indian, Black African and Chinese groups, amongst

others is on average higher. Pakistani and Bangladeshi females are the least qualified groups.

If the whole age group 18 and above is considered (Figure 2) the ethnic differences in attainment become even more accentuated with over one in four of the Black-African group with qualifications at diploma level and above compared with one in eight of the white population. The gender difference in the Black-Caribbean group is marked, with twice as many females as males having qualifications whilst for Pakistani and Bangladeshi groups it is females who have fewer qualifications than the males.

These findings are generally in agreement with those of Cheng and Heath (1993), who aggregated data from the LFS from 1983 to 1989 for their analysis, and Jones (1993) who aggregated data from the LFS for 1988 to 1990 for his analysis.

3. THE YOUTH LABOUR MARKET

A number of studies since the sixties have focused on the position of Afro-Caribbean and Asian young people in the labour market, and we have reviewed these elsewhere (Drew, 1993). Such statistical studies have grown in size and complexity (Table 1). What is of particular interest here is the analysis potential in the nineties of large nationally representative surveys such as the YCS, the LFS and the 1991 Population Census, to provide a regular picture of the changes taking place.

That unemployment is a major problem for ethnic minority young people there can be little doubt. Ethnic minority unemployment rates have, for over thirty years, always been higher than unemployment rates overall (Figure 3). For young people the unemployment rates in the Eighties for the West Indian, Pakistani and Bangladeshi groups were more than twice those of the white group (Figure 4).

The YCS showed that, at the age of 19, smaller numbers of Afro Caribbean and Asian young people were in full time employment than the white group (Drew, Gray and Sime, 1992) and that this was only partly explained by the numbers of ethnic minority young people staying on in the education system (Figure 5).

A series of logit models were used to model the probability of going on YTS and the probability of unemployment at 16 and 19. In these models, based on responses from 28,000 young people, account was taken of attainment, ethnic origin, social class, parental education and route into the labour market. The latter variable distinguished between those who had left school at 16 to take up jobs, those who continued in education and those who, at some time went on a YTS scheme.

The model for unemployment at age 19 (Table 2) showed two things. In the first place ethnic origin, social class, gender and parental education were all significant factors over and above educational attainment and route into the labour market. In the second place the odds of being unemployed for particular groups could be compared with the odds of being unemployed for the group of white young men from professional backgrounds, other things being equal and the results are striking. The odds of being unemployed was, for example, higher for Asians (by a factor of 2.2), for those from manual backgrounds (by a factor of 1.6) and for females (by a factor of 1.8). Since these odds ratios are multiplicative

this suggests that, for example Asian women from manual backgrounds are much more likely to be unemployed, other things being equal that their white, manual, professional counterparts and that these differences are large.

A contrasting study of data from the LFS on ethnic differences in the labour market was carried out by Cheng and Heath (1993). In their study the focus was on the probability of entering the 'service' class (the professional and managerial group plus higher grade technicians and other non-manual groups). They fitted a series of logit models using education, age and ethnic origin as factors and their interactions (Table 3). (Age was a relevant variable because this was a model for the whole age range not simply for young people). This showed high odds ratios for **not** reaching the service class most notably for Indian, Pakistani and West Indian men and Indian women after age and educational qualifications had been taken into account.

Although a similar model based analysis of the 1991 Census SARs has yet to be published, preliminary analysis shows that such an analysis is likely to be profitable. The Black African group, for example, is one of the most highly qualified groups and yet has one of the highest unemployment rates (Figure 6). Also, for males who are unemployed the Black African group is better qualified than any of the others (Table not shown).

What is particularly interesting about these model building exercises is what they reveal about ethnic differences in the labour market and what they potentially reveal about the continuation of racial discrimination. Before such conclusions can be considered, however, the strengths and weaknesses of such models should be discussed.

4. MODEL BUILDING

There are a number of stages in model building and these can be summarised as follows:

(i) Have a clear aim
(ii) Select the model
(iii) Specify the variables to be included
(iv) Investigate the model assumptions
(v) Check the adequacy of the model
(vi) Make inferences from the model.

Included within this list there are issues about what type of model to use (multiple regression, loglinear, logit or multilevel modelling), the form of the model once it is specified (whether or not to introduce particular variables, whether or not to model interactions), the model assumptions (whether or not the error terms are distributed as assumed in the model), the model adequacy (how much of the overall variation is accounted for by the model) and the inferences that can be made from the model (the predictions that are made and their appropriate error bounds).

In practice these decisions have to be made on a pragmatic as well as a theoretical basis. A multilevel model might in theory be a good one to use but the data available might preclude its use. As for variable selection, the variables selected may often be limited by what is available in the survey dataset. As for model adequacy, since most social science models have low explanatory power the best model that can be obtained may often have high-residual variance. As

for making inferences, when the model is used for predictions the inferences that can be made may be limited by high standard errors for the estimates.

All these factors are the result of the data never being ideal. What is required of researchers is that they are explicit about the limitations of their models and make the stages of the analysis clear. We will give three examples of this.

The first example is from (Cheng and Heath (1993) who used a logit model to model the probability of individuals being in the service (professional and managerial) class given their age, educational attainment and ethnicity (Table 3). Their results are very interesting. They showed, for example that whilst Indian men appeared to be reasonably successful in entering the service class relative to white men the difference, once attainment was taken into account, was much larger. Put another way, given the high educational attainment of Indian men we would have expected far more of them to have been in professional and managerial jobs than was actually the case. One limitation of their model is that they used a rather restricted set of variables since they only included age, attainment and ethnicity in the model (and interactions). A further presentational point is that whilst p values are presented to indicate that the inclusion of each new variable is statistically highly significant, there is no discussion of overall goodness of fit (the deviance for the grand mean model is not given) and no indication to the reader, therefore, of the adequacy of the model.

In the second example Drew, Gray and Sime, (1992) in their logit model of unemployment presented odds ratios for each ethnic, social class and gender group to indicate the relative disadvantage of particular groups (Table 2). Although standard errors for the parameter estimates of the logit model are given, there are no error bounds for the odd ratios so, given that some of the ethnic groups are rather small, the inferences that can be made from these odds ratios is not sufficiently clear.

In the third example Nuttall and Goldstein et al (1989) used a multilevel method to examine attainment differences at 16 and to take account of school differences. Whilst generally these authors are very careful about making inferences from the model and whilst, in general, the presentation of goodness of fit is rather more difficult with a multilevel model than it is with a simple regression model, we feel that issues of model adequacy could have been more clearly discussed in their paper.

The examples above are given because the studies, represent in most respects, examples of good practice and in all three cases the results are substantively very interesting. As Goldstein (1993) says 'One of the useful things about mathematical and statistical models of educational realities is that one can obtain conclusions which are, in their own terms, beyond reproach. The awkward thing about these models is the snares they set for the casual user; the person who needs the conclusions, and perhaps also supplies the data, but is untrained in questioning the assumptions'. No one wants to be found guilty of that.

5. CONCLUSIONS

One purpose of this paper was to focus on recent trends and the second was to review the contribution of the analysis of large nationally representative data sets to current debates.

It is unlikely that the differences that Afro-Caribbean and Asian young people experience in the labour market will recede in the Nineties. Unemployment has increased again as the economy has moved into recession and ethnic minority young people have been particularly affected. Unemployment in 1992 was close to 3 million with Pakistani and Bangladeshi rates about three times the average. There will therefore continue to be a need for the analysis of large, nationally representative data sets to monitor these trends. Much more work needs to be done to make use of the continuing nature of such surveys to monitor change over time and reveal the changes that are taking place.

A second change in approaches to research will be the level of data analysis. Afro-Caribbean and Asian young people may have in many cases a common experience of racism but it will be important for future research to focus on particular groups to examine differences between them. The Asian group has to be differentiated, for example, to take into account the different experiences of Indian young people and those from Pakistani and Bangladeshi backgrounds. In a similar way the 1991 Population Census apparently shows that there are important differences between those of Black-African backgrounds compared with those of Black-Caribbean backgrounds and these two groups need to be treated separately where that is possible.

There is also a growing need to explore the interrelationship between ethnic origin, gender and social class and this too should be reflected in the way data is analysed and discussed. Robinson, (1990), for example, in an analysis using the OPCS Longitudinal Study has argued that there is a growing polarisation within the Indian community with some individuals moving rapidly upwards into white collar work at the same time as sizeable numbers are experiencing downward mobility into unemployment. Social as well as geographic mobility within countries in Europe will have a continuing importance.

A further aspect of the level of data analysis is the progress that has been made in the development and use of multilevel analyses; in studies of education to reflect the effect of schools and in studies of work to reflect the effects of local labour markets (see Raffe and Willms, 1989). Such analysis will continue to be of importance.

The greater availability and improvement in large nationally representative data sets should make comparisons easier. Enhancements to the Labour Force Survey in 1992 mean that more detailed analyses and comparisons could be routinely made and published. This could include more detailed analyses of existing indicators but could also routinely include new analyses, for example, of income, since differences in income levels by ethnic group, socioeconomic group and educational qualifications could become increasingly interesting as progress towards equality (or not) is made.

In the United States Current Population Survey data is used to study ethnic differences in income levels after controlling for attainment and other variables and to measure trends towards equality over time (see Thomas, 1993). Similar analyses on gender and ethnic inequality are much more common there than here.

Finally, the increased use of model building techniques means that more detailed questions can now be addressed with the greater availability of large data sets. Much progress has been made since some of these ideas were first mooted a few years ago (see Plewis, 1988). The limitations of such models must however be understood and their findings carefully and clearly presented.

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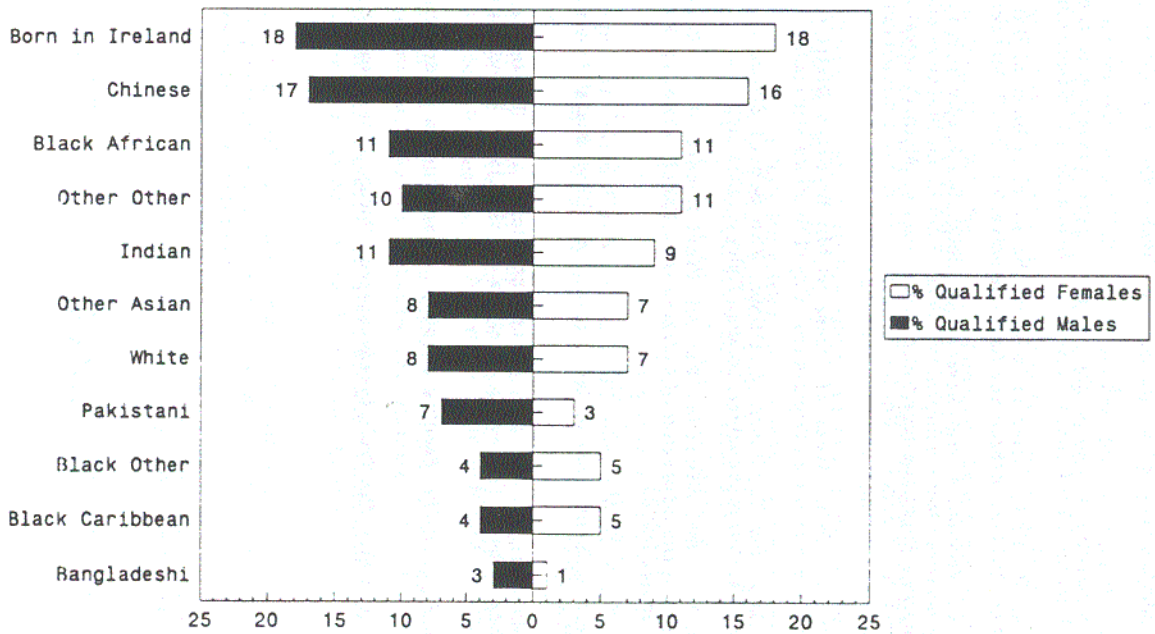
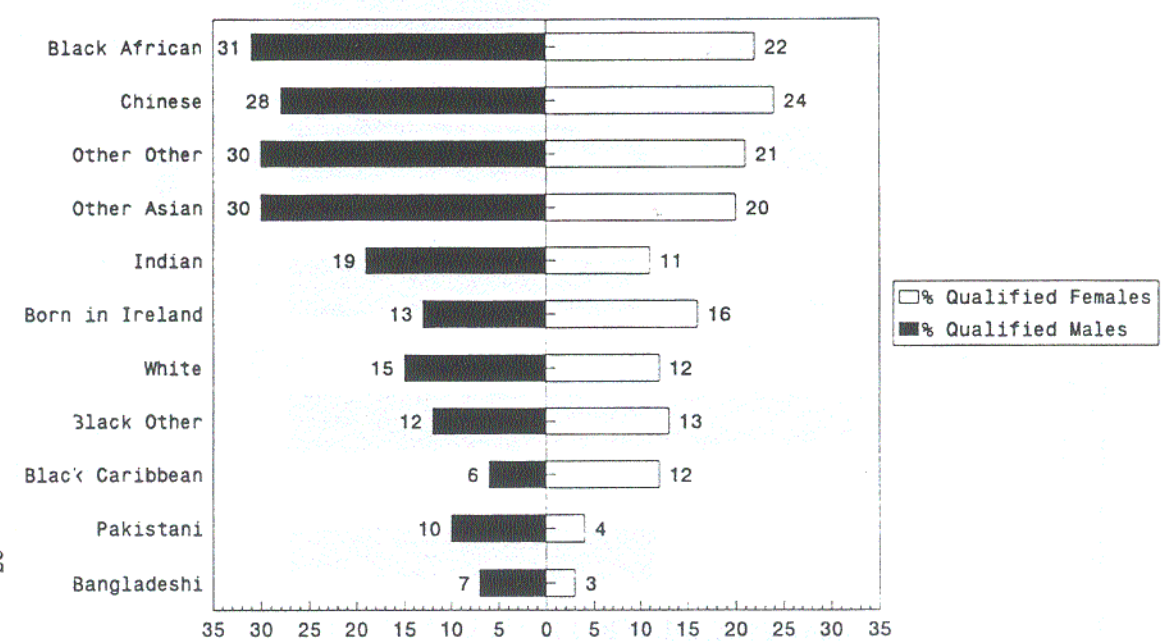
Figure 1 : Percentage Qualified*,aged 18 - 24,by Ethnic Group and Sex



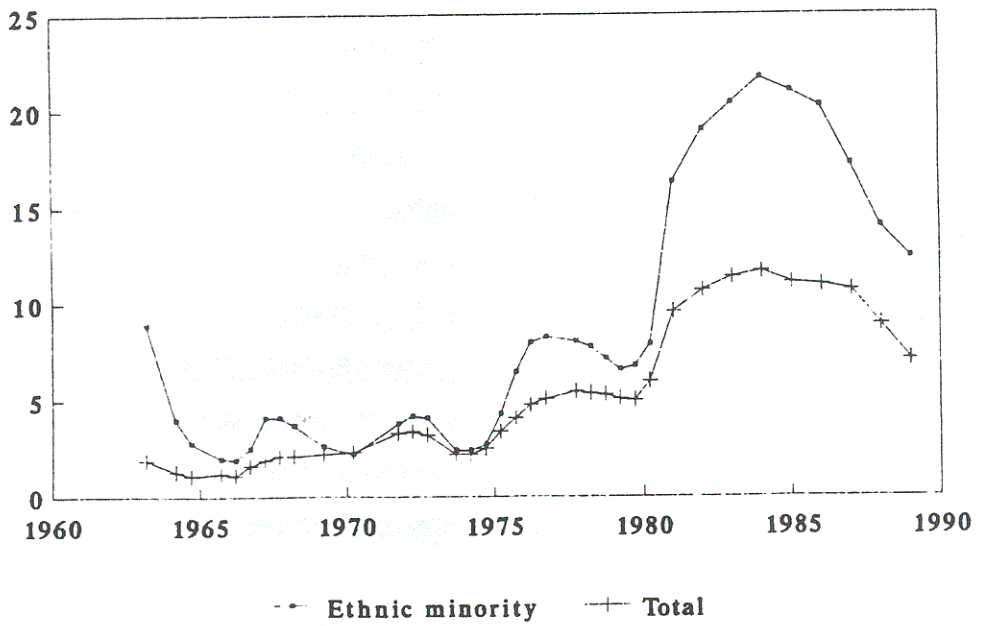
Source: 1991 Census ,Great Britain

Figure 2 : Percentage Qualified*,aged 18 and over,by Ethnic Group and Sex



Source: 1991 Census,Great Britain

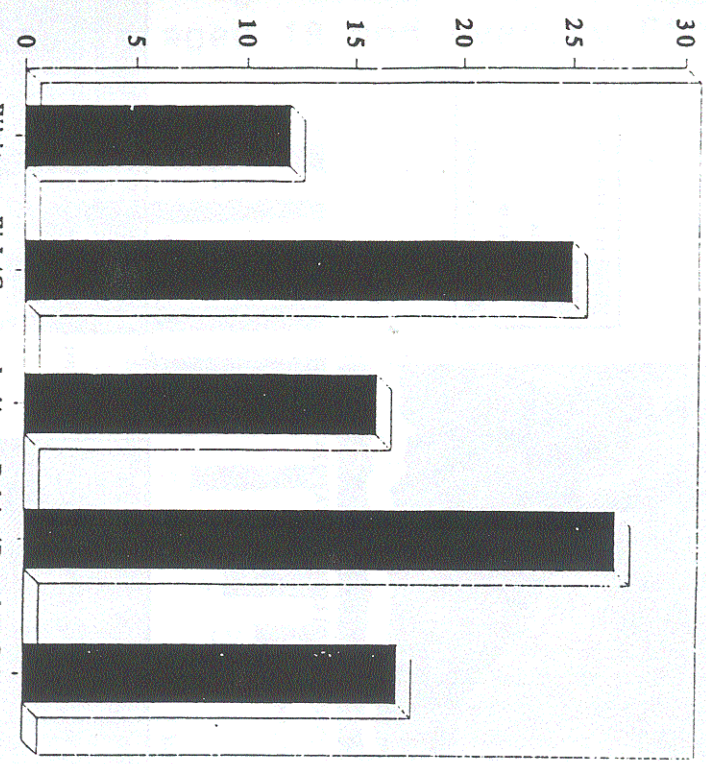
FIGURE 3 TOTAL AND ETHNIC MINORITY UNEMPLOYMENT RATES 1963-1989



Source:Field,Robinson.Age group 16-59/64

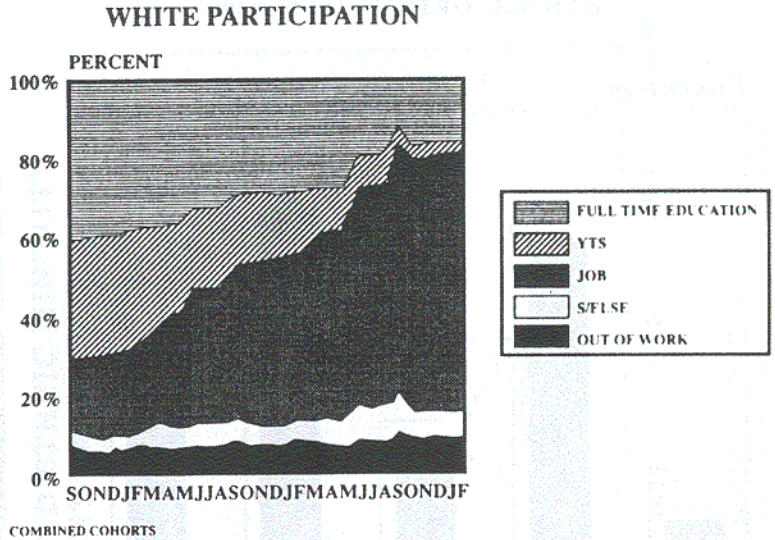
Figure 4

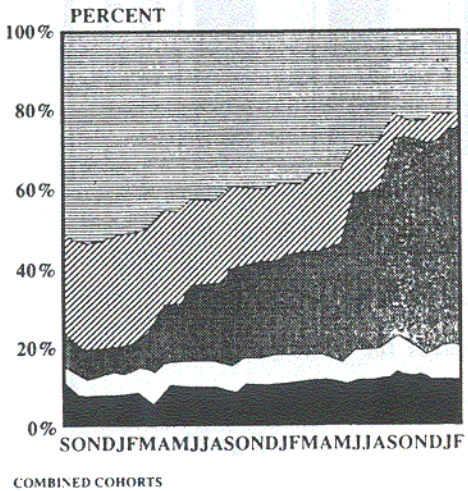
FIGURE 4 YOUTH UNEMPLOYMENT RATES BY ETHNIC ORIGIN 1987-1989



Source:Labour Force Survey. Unemployment for 16-24 year age group

Figure 5 : Labour Market Activities 16-19 (Cumulative Percentages)





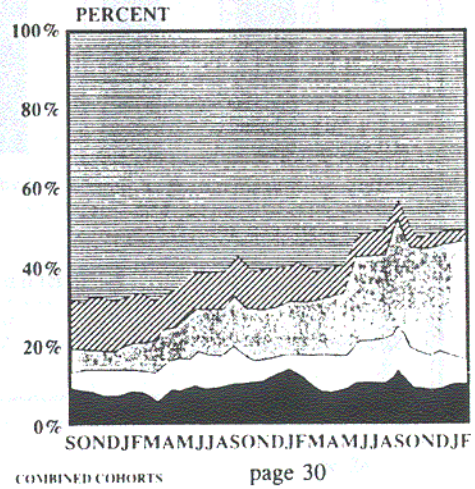
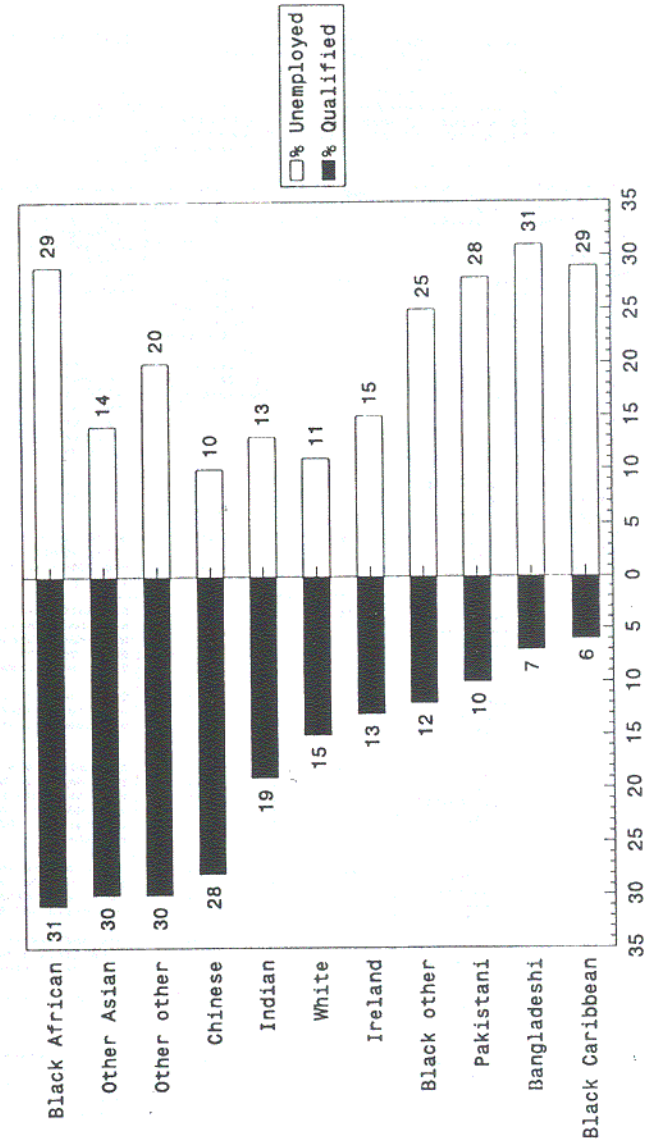


Figure 6 : Percentage Qualified and Percentage Unemployed*,males aged 18 and over,by Ethnic Group



Source: 1991 Census,Great Britain

TABLE 1 FEATURES OF SELECTED BRITISH STUDIES OF ETHNIC DIFFERENCES IN THE YOUTH LABOUR MARKET

Study and Author(s)	Year Data Collected	Sample Sizes Total/Afro-Caribbean/Asian	Nature of Sample
Daniel (1968) 1st PEP/PSI	1966	974 540 333	6 areas of Britain. The 2 wards in each area with the highest density of immigrant population were selected.
Dept. of Employment Labour Force Survey	1984-	60000 overall sample each year in Gt Britain since 1984	Multi-stage stratified random survey.
Smith (1974) 2nd PEP/PSI Study	1974	A sample of 283 employers	A survey of 283 employers at plant level. Excluded areas with small immigrant population. 3 separate regions: North, Midlands, South.
Wrench and Lee (1983)	1979	697 169 226	Fifth form pupils in four Birmingham schools.
Smith (1981)	1979	2454 524 946	A survey of the unemployed, 18 employment areas sampled.
Roberts, Noble and Duggan (1983)	1979	551 280 -	Six multi-racial neighbourhoods: Brixton, Harlesdon, Shepherds Bush, Toxteth, Moss Side, Wolverhampton.
Banks, Ullah and Warr (1984)	1982	1150 374 -	Quota sample of youth unemployed aged 17 in 11 geographical areas.
Brown (1984) 3rd PEP/PSI Study	1982	7306 1650 3350	2 samples, one of white respondents, the other of ethnic minority respondents. 260 clusters of 1000 EDs selected.
Clough, Drew and Jones (1985)	1983	2818 93 264	Young people aged 16-18 sampled from Careers Service records in Sheffield and Bradford.
Cross, Wrench and Barnett (1990)	1985	896 166 282	Matched sample selected from Careers Service records in nine areas.
Jones (1993)	1988-90	54203* 762 1774	Labour Force Survey.
Connolly et al (1992)	1989	1228 126 15	1094 in general sample of Liverpool 17-19 year olds plus special sample 134 blacks

Note:
* Numbers in 16-24 age group in survey

Table 1A:

Study and Author(s)	Year Data Collected	Sample Sizes Total/Afro-Caribbean/Asian	Nature of Sample
Drew, Gray and Sime (1992) Youth Cohort Study	1985-89	26082 483 910	Random sample of maintained schools in England and Wales and fixed percentage of pupils in each school.
Cheng and Heath (1993)	1983-89	13034* 912 2566	Labour Force Survey 1 in 20 respondents sampled.
OPCS Population Census	1991	1272618* - -	Great Britain, 2 per cent sample of individuals and 1 per cent of households.

Notes:
* All ages

TABLE 2. LOGIT MODEL FOR UNEMPLOYMENT RATE AT 19**

	Deviance Explained	Degrees of Freedom	Estimate	Standard Error	Odds Ratio
Grand Mean*			-1.66	0.13	-
Route	368	4			
2+ A levels			-	-	1.0
Other FTE			-0.80	0.12	0.5
YTS			-0.90	0.13	0.4
Traditional			-1.71	0.14	0.2
Others			-0.33	0.13	0.7
Attainment	324	4			
2+ A levels			-	-	1.0
NVQ 1,2			0.15	0.14	1.2
4+ higher grades			0.27	0.13	1.3
1-3 higher grades			0.62	0.15	1.9
0 higher grades			1.25	0.14	3.5
Ethnic Origin	20	3			
White			-	-	1.0
Afro-Caribbean			0.41	0.20	1.5
Asian			0.79	0.19	2.2
None of these			-0.06	0.14	0.9
Social Class	33	2			
Professional			-	-	1.0
Intermediate			0.20	0.08	1.2
Manual			0.44	0.08	1.6
Gender	122	1			
Male			-	-	1.0
Female			0.57	0.05	1.8
Parental Education	32	1			
Graduate			-	-	1.0
Non-graduate			-0.46	0.08	0.6

Pseudo R-Square 0.57

Deviance for Grand Mean 1589 with 507 degrees of freedom
Deviance for model 688 with 492 degrees of freedom

Notes:

* Base group are those following the 2+ A levels route, with 2+ A levels, white, professional parents, male, graduate parents.

** The unemployment rate is defined as the numbers unemployed or doing something else as a percentage of those not in full-time education.

Source: Drew, Gray and Sime (1992)

TABLE 3 : LOGIT MODEL FOR PROBABILITY OF BEING IN THE SERVICE CLASS

Model A: $\text{Ln}(P/1-P) = b_o + b_1(\text{eth})$

Model B: $\text{Ln}(P/1-P) = b_o + b_1(\text{eth}) + b_2(\text{educ})$

Model C: $\text{Ln}(P/1-P) = b_o + b_1(\text{eth}) + b_2(\text{educ}) + b_3(\text{age}) + b_4(\text{age educ}) + b_5(\text{age eth})$

Model D: $\text{Ln}(P/1-P) = b_o + b_1(\text{eth}) + b_2(\text{educ}) + b_3(\text{age}) + b_4(\text{age educ}) + b_5(\text{age eth}) + b_6(\text{eth educ})$

Model D*: $\text{Ln}(P/1-P) = b_o + b_1(\text{eth}) + b_2(\text{educ}) + b_3(\text{age}) + b_4(\text{age educ}) + b_5(\text{age eth}) + b_6(\text{eth cos})$

TABLE X1 *Logit models for male immigrants ethnic parameters*
(figures in brackets give the standard errors)

	Model A	Model B	Model C	Model D	Model D*
Constant	0.62	2.9	1.29	1.52	1.40
	(0.03)	(0.05)	(0.15)	(0.20)	(0.19)
Chinese	0.10	0.30	0.10	0.09	0.09
	(0.13)	(0.17)	(0.33)	(0.56)	(0.14)
Indian	0.51	1.06	-0.95	-1.67	-0.29
	(0.05)	(0.09)	(0.25)	(0.29)	(0.06)
Pakistani	1.52	-1.78	1.25	1.60	-0.04
	(0.14)	(0.16)	(0.37)	(0.47)	(0.11)
West Indian	1.53	1.30	0.77	1.14	0.10
	(0.12)	(0.15)	(0.36)	(0.52)	(0.11)
African Asian	0.36	1.06	0.35	-0.77	-0.16
	(0.10)	(0.12)	(0.22)	(0.32)	(0.10)
Irish	0.61	0.38	0.35	0.37	0.04
	(0.06)	(0.08)	(0.21)	(0.39)	(0.06)
G^2	3539	491	267	181	
d.f	267	258	181	157	
p-value	0.00	0.00	0.00	0.09	
Index of dissimilarity	35.94	9.70	5.53	4.32	

Source: Cheng and Heath (1993)