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Routes of success: influences on the occupational attainment of young British males

ABSTRACT

Using data from the National Child Development Study, the paper develops a complex path model predicting the occupational grade achieved by 4,298 employed British males at age 33. Most British social mobility research has been based in the 'class structurationist' tradition, and the paper begins by comparing this with the 'status attainment' tradition, which is more common in the USA. The class structurationist approach has rarely analysed the factors influencing individual occupational attainment, and those working in this tradition in Britain have often *assumed* that people from working-class origins fare worse on average than those from the middle class because of factors associated with their class disadvantage rather than any difference in individual characteristics such as ability or ambition. Status attainment research, however, has generally found that individual ability and motivation are the key factors influencing occupational attainment, and that class origins count for comparatively little. Using various measures of class origins, parental support, qualifications, and individual ability and ambition, the paper goes on to develop a linear structural equations model which achieves a good fit to the data. The model demonstrates that individual ability is by far the strongest influence on occupational achievement, that motivation is also important, and that factors like class background and parental support, while significant, are relatively much weaker. The paper concludes that occupational selection in Britain appears to take place largely on meritocratic principles.

KEYWORDS: Social mobility; status attainment; meritocracy; Britain; social class; IQ

In a recent speech, the British Prime Minister, Tony Blair, declared 'The Britain of the elite is over. The new Britain is a meritocracy where we break down the barriers of class, religion, race and culture' (*Daily Telegraph*, 25 October 1997: 6). Like John Major before him, Mr. Blair is wedded to a vision of Britain as a 'meritocracy'.

The defining feature of a meritocratic society is that occupational selection is based solely on individual ability and effort. In a meritocracy, social origins are irrelevant in determining social destinations (Young 1958). At

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first glance, contemporary Britain seems to fall a long way short of this ideal, for we know from many years of social mobility research that social class origins are still significantly associated with social class destinations in this country. In a 1972 survey of ten thousand men, John Goldthorpe found that those from 'service-class' backgrounds (i.e. the sons of professional, managerial and higher administrative grade fathers) were about four times more likely to end up in service-class positions than those who were born and raised in working-class homes. This disparity may have lessened somewhat since then – in a 1983 follow-up, Goldthorpe found that it had fallen to around 3: 1 (Goldthorpe 1987), and in research on a 1958 birth cohort, one of us has reported that those born to class I/II parents were just over twice as likely to end up in the middle class as those born to class IV/V parents (Saunders 1997) – but there clearly is a persisting association between class origins and class destinations.

Sociologists (including Goldthorpe) have generally assumed that much or all of this association is explained by the social advantages and disadvantages flowing from the operation of the class system itself. This argument, which we term the 'SAD thesis', has a long sociological lineage, for down the years, many class-based factors have been identified as significant in generating middle-class 'overachievement' and working-class 'underachievement'. These include the different endowments of 'cultural capital' in middle-class and working-class homes (Bourdieu 1974), the susceptibility of working-class boys to anti-school peer group pressures (Willis 1977), the supposed bias in the educational system favouring middle-class linguistic codes (Bernstein 1965), the operation of streaming and setting as disguised mechanisms of social selection within the education system (Abraham 1995), and the impact of social and physical deprivation in the home, such as lack of parental support and ambition, or physical overcrowding (Douglas et al. 1968).

There is, however, a different but equally plausible explanation for why those from middle-class origins tend to outperform those from lower-class origins. It is possible that on average, middle-class children have higher ability and/or exhibit a higher level of effort. This alternative explanation, which is consistent with the operation of a 'meritocracy', would suggest that individuals selected for positions on the basis of their ability and hard work in one generation tend to produce children with similar levels of ability and motivation who will then be selected for similar occupational positions in the next generation. Seen in this way, the association between class origins and class destinations is a function of the mediating effect of class differences in individual ability and motivation which are to some extent transmitted from one generation to the next.

Of course, the SAD thesis and the meritocracy thesis are not necessarily mutually exclusive. It is quite possible that both social advantages and disadvantages and individual ability and motivation play a part in influencing where people end up in the class system. An obvious problem, however, is that the different measures associated with each of these two theses are

closely interconnected, and this can make it difficult to disentangle their relative effects.

It was in order to unpack such complex associations that Blau and Duncan (1967) pioneered the use of path models in their classic work on social mobility in the USA. Using regression-based path coefficients, they sought to identify the relative importance of different factors in explaining how individuals come to attain different occupational positions (an approach which has come to be known as the *'status attainment'* tradition in social mobility research). This tradition of work contrasts sharply with that developed in Britain from the 1970s onwards by researchers such as Goldthorpe, where the principal concern was to assess the extent to which social mobility contributes to or undermines the structural cohesion of different social classes over time. This focus has little to do with status attainment, but is rather addressed to the problem of *'class structuration'*, and those working in this tradition have tended to be critical of the methodology employed in the status attainment approach.

TWO TRADITIONS IN SOCIAL MOBILITY RESEARCH

These two approaches in social mobility research have tended to differ, not only in the questions they seek to address, but also in the way they measure key concepts and the methods they employ to analyse their evidence. The status attainment approach has generally taken as its dependent variable some measure of occupational status organized as a graded hierarchy, and has tried to predict individuals' positions on this hierarchy with reference to various attributes such as their socio-economic background (e.g. parents' occupation and education levels), their education and qualifications, and their measured intellectual ability. This has entailed the construction of path models in which the standardized effects on occupational status of the various independent and mediating variables are computed, and the overall model fit is assessed according to the proportion of variance in occupational status that is explained by all the variables in the model.

In their original work, for example, Blau and Duncan (1967) managed to explain more than one-third of the variance in individuals' occupational status scores with reference to their IQ scores, their education and their socio-economic background, and they showed that individual ability (measured by IQ) outweighed the influence of social origins or education in influencing occupational attainment. Subsequent work on status attainment, both in Britain and America, has tended to confirm (a) that individual ability, measured by IQ, is an important influence on occupational attainment, (b) that factors such as class origin also exert an independent, though generally less powerful, influence, and (c) that much of the variance in occupational destinations nevertheless remains unexplained by either individual or class background variables (we review some of the British work below).

In contrast with the status attainment tradition, the class structuration approach rejects the use of occupational scales, preferring instead to use a categorical class schema such as that devised by Goldthorpe himself. Rather than ranging individuals on a continuous scale of occupational prestige, this approach focuses on the structured system of social relations which finds expression in clusters of occupations which are said to constitute common class positions. In place of occupational status, the key concept is that of social class understood in neo-Weberian terms as a common market situation in which life chances are determined by ownership of property and/or the exercise of authority and autonomy in the workplace. Clear boundary lines are drawn between the various classes, and social mobility is defined not as movement along a continuous scale, but as movement between discrete class categories (specifically, into and out of the 'service class'). This approach has paid little attention to the issue of why and how particular individuals end up where they do in this system, and it has therefore had no use for path models.[1] Instead, it has used loglinear models, based on computation of odds ratios, to investigate the relative degree of stability or movement between different class categories while controlling for changes over time in the proportions of the population occupying each category. In this way, Goldthorpe and others have been able to demonstrate that relative social mobility rates appear fairly constant over time and do not differ markedly between different advanced societies.

For thirty years, these two traditions of work in social mobility have followed distinct trajectories. Addressing different questions, they have developed different methods and have employed different concepts and different theories. In principle, they are not incompatible, and some research (such as Hope's 1984 work on a Scottish data set, or Ishida's 1993 comparative analysis of social mobility in Japan, Britain and the USA) has utilized both approaches. More often, however, they have been seen as competing, even as mutually exclusive, and since the 1970s, the status attainment approach in particular has been roundly attacked for what its critics see as its fundamental methodological and theoretical flaws.

IN DEFENCE OF PATH MODELS

Although most work in the status attainment tradition has been carried out in the USA, a number of studies have been completed on British data. Kerckhoff (1974) used the 1946 birth cohort study originally analysed by Douglas et al. (1968) to analyse educational attainment in England and to compare it with the USA. He developed models which explained between one-third and one-half of the variance and which showed similar results for the two countries, with ability influencing children's success much more strongly than father's education, father's occupation or family size. Psacharopoulos (1977) used the General Household Survey to produce a path model predicting earnings of employed adult males. Again, the model

accounted for around one-third of the variance in the dependent variable, and again it showed that class background (measured by father's occupation) was a relatively weak predictor variable, although in this study, ability (measured indirectly by exam results and type of schooling rather than by IQ) seemed to add little explanatory power once years of schooling had been entered into the model.[2]

Work in this tradition continued in the 1980s with Mayhew and Rosewell's 1981 analysis based on Goldthorpe's Nuffield data, and with Hope's 1984 Scottish study. Both of these took the Hope–Goldthorpe occupational prestige scale as their dependent variable, and both found that education and parental background had a significant, but not large, effect. Mayhew and Rosewell concluded that 'other factors' such as individual motivation and effort might prove more important if they were included in future models, and Hope's study (based on data from the Scottish mental survey of 1947) showed that this was indeed the case. Ability (measured by IQ) was, he found, much more important than class background in influencing occupational attainment, and individual effort (assessed by teacher ratings) was also found to have a significant effect. Material deprivation during childhood had no effect at all once social class was taken into account. Hope concluded that around 60 per cent of the variance in social mobility is explained by ability alone, and he argued that the selective system of education operating after the war had brought Scotland close to the achievement of meritocracy (or what he called a 'meritelective' system).

Research demonstrating the importance of individual ability and effort in influencing occupational attainment has continued to be published in the 1990s. Kerckhoff (1990) analysed data from the fourth sweep of the National Child Development Study (NCDS) and showed that ability and socio-economic background both had significant effects on qualifications gained at school, and that these qualifications were the crucial influence on the status of the first job entered after leaving school. He also showed that upward mobility between the first job and the job held at age 23 (the cut-off point for sweep 4 of this continuing panel study) was associated with IQ and teacher ratings while at school, thus demonstrating that ability continues to exert an influence on occupational attainment even after entry into the labour market. Meanwhile, Ishida (1993) has analysed the Nuffield mobility data using path models and shows that education and class background (especially family income) both influence occupational attainment in Britain, the former slightly more than the latter. He suggests that class background affects educational attainment independently of IQ differences, but since his data set has no measure of ability or cognitive skills, this claim amounts to little more than speculation.

It will be clear from this brief review that the status attainment approach, pioneered in the USA a third of a century ago by Blau and Duncan, has successfully been employed in a number of different studies in Britain, and that when it has been used, it has tended to point to the importance of ability and effort in influencing class destinations. In other words, most of

the work in the status attainment tradition seems to indicate that occupational selection in contemporary Britain is to a considerable degree meritocratic (although all studies also find that class origins do still have some effect). These findings have not, however, had much impact on mainstream sociological writing about social mobility in Britain which has been dominated since the 1970s by the class structuration approach.

This approach (e.g. Goldthorpe 1987, Marshall et al. 1988) has never gathered information on the intellectual ability or level of motivation of individuals who move up or down the class system,[3] and it has therefore never been in a position to evaluate the competing claims of the SAD and meritocracy theses. Nevertheless, key figures in this tradition have continued to deny the validity of the meritocracy thesis. Emphasizing the disparities in the chances of children from different backgrounds achieving occupational success, they assert that the differences must be due to the operation of class barriers favouring the children of the middle class and blocking the children of the working class. As Payne (1987) has noted, this is an assertion which accords with the assumptions and ideological prejudices of most British sociologists, and this probably explains why these unsubstantiated claims have rarely been challenged. Instead, they are simply recycled uncritically in sociological textbooks on class and inequality (see, for example, Scase 1992).

There are three main reasons why research findings in the status attainment tradition have failed to dent British sociology's faith in the SAD thesis, despite mounting evidence that individual ability and hard work are more important influences on where people end up in the occupational system than their class origins.

The first is that path models always leave much unexplained, for the proportion of variance in occupational status explained by these models rarely approaches 50 per cent. One reason for this has to do with inevitable measurement error, but there is also a sense in the literature that some of the key influences in people's lives either cannot adequately be captured by these models (Mayhew and Rosewell 1981: 243) or must be put down to sheer luck (an argument first proposed by Jencks, 1972). Bielby (1981), for example, argues that potentially crucial influences on status attainment, such as the emotional quality of family life, are neglected in this tradition of research and cannot easily be measured, and many other critics are sceptical about the use of IQ tests to measure ability.

Against such criticisms, however, it is clear that various aspects of personality can be adequately measured and incorporated into path models (see, for example, Sewell et al. 1969 and Kelley 1990: 322). It is also the case that advances in computing power and in statistical modelling now enable us to develop highly complex path models incorporating many interacting variables. Just as the development of loglinear modelling enormously improved the sophistication of work in the class structuration tradition from the 1970s onwards, so too the development of linear structural equations modelling has opened up new possibilities for status attainment

research today, for it is now possible to unravel chains of multiple causation which could never have been analysed using older regression-based techniques.

A second reason why the status attainment tradition has had relatively little impact on British sociological orthodoxy is that it was accused early on of being 'functionalist' and ideologically conservative. Key findings – that Britain is a relatively 'open' society, for example, or that ability tends to count for more than class background in influencing where people end up in life – have been disregarded on the grounds that they are the product of an inherently biased methodology. The charge pertains mainly to the use of occupational prestige scales as the dependent variable in path models. Horan (1978) is only one of a number of critics who have argued that such scales erroneously imply a social consensus over the evaluation of different occupational positions (an assumption Horan traced back to Talcott Parsons and the functionalist theory of stratification).

There are, however, occupational scales (such as the 'Cambridge scale') which measure social patterns of association, rather than occupational prestige, and which do not therefore depend on any assumption of value consensus over the worth of different positions. These scales look very similar to those based on prestige rankings (the Cambridge scale and the Hope–Goldthorpe occupational prestige scale, for example, correlate at 0.88 – Stewart et al. 1980: 76), and this high degree of external reliability seems to suggest that the problem of 'ideological contamination' of occupational prestige scales has probably been exaggerated.

Furthermore, there are strong grounds for arguing *for* the use of occupational measures involving a continuous scale and *against* categorical schema (such as the Registrar-General class schema or the Goldthorpe schema) which invariably run up against the problem of identifying class 'boundaries' where in reality there are none (see, for example, Kelley 1990 and Prandy and Bottero 1995). Given the continuing debate in British sociology about the relevance of class analysis, there is surely a strong case for using occupational scale measures as much as categorical schema in empirical research. Indeed, as Hope (1984: 16) suggests, there is no reason why we should not use both.

The third problem which critics identify in the status attainment tradition is that it is 'individualistic' and that it ignores 'social structure'.[4] Lewis Coser (1975), for example, suggested that the status attainment approach fails to address the question of how the structures of power and privilege (which constitute the class positions between which people move) come to exist and to be reproduced in the first place. The existence of the class structure is taken as given, and the research focuses only on individual movement within it – on the trees and never on the wood.

This is clearly true, in the sense that status attainment research does not try to address the 'big' question, which lies at the heart of the class structuration approach, of whether and how class relations are reproduced over time. But it is not true to suggest that the status attainment tradition takes

no account of 'structural' variables (most path models aim precisely to identify the relative importance of 'individual' qualities such as ability or motivation, and 'structural' conditions, such as schooling or material deprivation in the home), nor does it follow from Coser's criticism that the questions which are addressed in this kind of research are in some way trivial or unimportant. Indeed, as Coser himself recognized, 'There is surely a need for both types of studies' (1975: 695).

There are, then, no good *a priori* grounds for privileging the structurationist approach to social mobility over the status attainment approach. Indeed, we have arguably reached a point where the hitherto dominant tradition in Britain of class structurationist work has taken us as far as we can usefully go without pausing to reflect on *why* certain individuals experience social mobility when others do not. Goldthorpe and others have clearly documented the extent of social mobility in Britain, but they have not addressed the question of why some people take advantage of the 'structural' opportunities available to them while others do not. This is the question we now seek to answer.

CONSTRUCTING THE PATH MODEL

The source of our data is the National Child Development Study which targeted all seventeen thousand children born in Great Britain in one week in March 1958, 98 per cent of whom were included in the initial sample (NCDS0). These children were then followed up at ages 7 (NCDS1, 1965), 11 (NCDS2, 1969), 16 (NCDS3, 1974), 23 (NCDS4, 1981) and, most recently, at age 33 (NCDS5, 1991). In addition, details of public examination results for all cohort members were obtained from their schools in 1978. By 1991 the size of the panel had shrunk to just under 11,400, and this has led to some under-representation of those from lower social classes, from poorer housing conditions, with lower aspirations and with lower scores on tests of cognitive ability (Shepherd 1993).[5] We have further reduced our sample size by focusing only on males in full-time employment at age 33 (in later papers we intend to consider separately the mobility patterns of women and of those in part-time or no employment), and a further 13 per cent of cases have been dropped for lack of adequate data over a range of variables. This leaves us with a final sample size for this analysis of 4,298. Few of these cases have complete data on all variables, and mean substitution has been used to replace missing values.[6]

Our aim is to develop a model predicting the occupational grade (measured on the Hope–Goldthorpe scale) achieved by this sample of men at age 33.[7] We have organized the predictor variables into four broad categories – social class origins, parental support, individual ability and motivation in early life, and formal qualifications achieved from the age of 16 onwards. In each case, these variables are measured at different points in time, corresponding to the various sweeps of NCDS (e.g. father's class is

measured at ages 7, 11 and 16; qualifications are measured at 16 and at 33; and so on), so that we build up a picture of how different influences produce different effects over time.

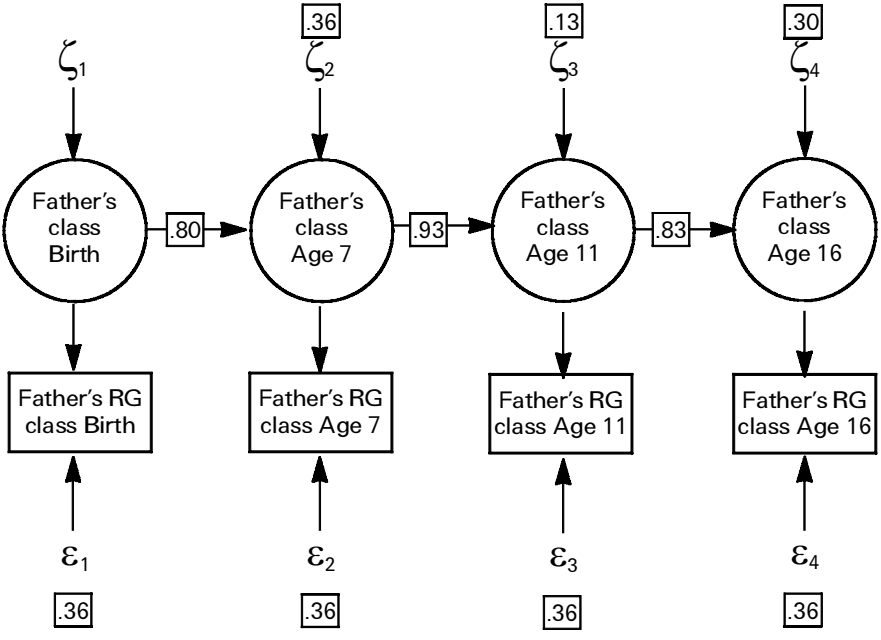
Social Class Origins

Our measures of the social background of our sample include whichever was the higher of the maternal and paternal grandfathers' social class, plus the father's class (recorded at the child's birth, and again at ages 7, 11 and 16), the mother's class (recorded when the child was 16), mother's and father's schooling (measured by whether or not they left school at the minimum leaving age), whether or not the child attended a private school (at age 7 and again at 16),[8] and the housing conditions (measured by an index of overcrowding) in which the child was living at sweeps 1, 2 and 3.[9] Between them, these twelve measures should adequately capture the kinds of differences which the SAD thesis claims are crucial in explaining the differential educational and occupational success rates of children from different types of backgrounds.

The social class of grandparents and parents is measured on whichever version of the Registrar-General's schema pertained at the time when the information was collected (e.g. father's class at sweep 1, in 1965, is based on the 1961 schema, and at sweep 3, in 1974, on the 1971 schema). In all cases we have coded to just three categories representing the professional/managerial/administrative 'middle-class' (classes I and II), an 'intermediate class' of skilled employees (classes IIIN and IIIM), and a core 'working-class' of semi and unskilled manual workers (classes IV and V). For the purposes of our analysis, we treat these three classes as an ordinal scale.[10]

Because we have four measures of father's class spread over 16 years, we have analysed these measures at each point in time as fallible indicators of latent constructs and have estimated their reliability. Treating them as fallible (rather than perfect) indicators means fixing their reliabilities at some value less than 1.0. Following the method outlined by Werts, Joreskog and Linn (1971; see also Heise 1969 and Wiley and Wiley 1970), the reliability of the first and last wave is not identified, but those of intermediate waves are, (this assumes that errors are independent and that a lag-1 autoregressive model represents development over time). Given four panel sweeps, the reliabilities of the second and third sweeps were separately identified and this model was fitted (a second model was then fitted where these two reliabilities were assumed to be equal, and it was found that the fit was not significantly worse, suggesting that the assumption of equal reliability was reasonable). The reliability estimated was 0.64 and this was assumed to be the reliability for all four social class measures.[11]

Figure I presents the results of these analyses and depicts the pattern of intragenerational social mobility for fathers. Not surprisingly, there is a fair degree of stability in father's social class, although from the respondent's



Model	$\chi 2$	*df*	GFI	$\Delta\chi 2$	Δdf	ΔGFI
Identity at age 7 and 11	2.01	1	1.00	–	–	–
Equal errors	4.79	2	1.00	2.78	1	0.00
Equal reliability = 0.64	4.85	3	1.00	0.06	1	0.00
Lag–1, reliability = 1.0	628.5	3	0.938	623.7	1	0.06

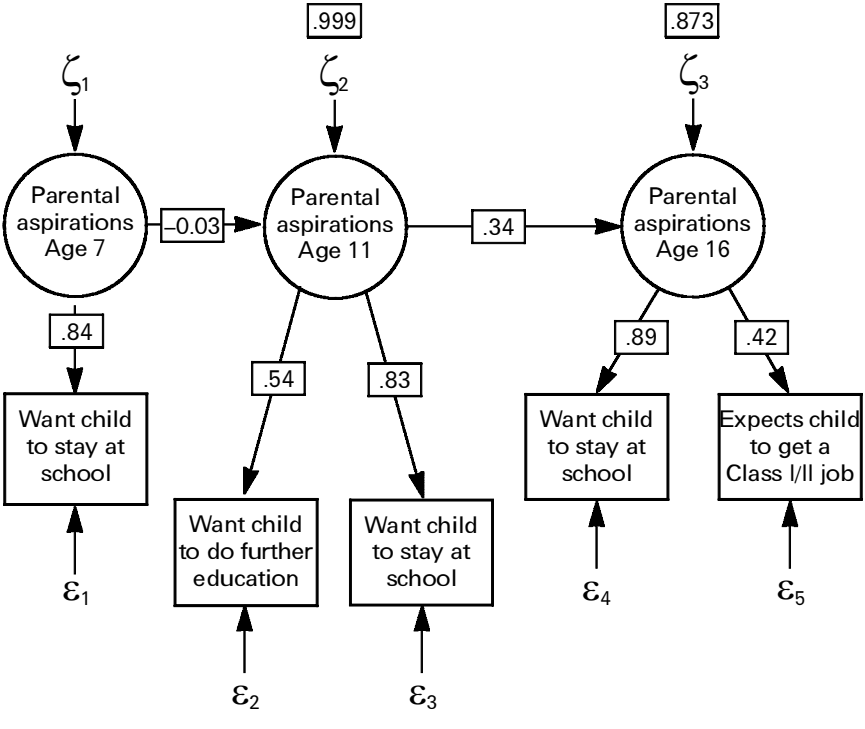
FIGURE I: *Father's class: Intragenerational mobility: standardized solution*

birth to when he is aged 16 the stability coefficient is 0.62, indicating only 38 per cent of the variance in father's class when the respondent is aged 16 is predictable from his class at the respondent's birth. When the grandparents' class and the panel members' own occupational status at age 33 (measured using the Hope–Goldthorpe scale) are added, the extent of intergenerational mobility between three generations can be assessed.[12] For grandparents' class, the path to father's class at the respondent's birth was 0.45 but it was also necessary to include a path (coefficient 0.12) to father's class when the respondent was aged 7. The coefficient from father's class when the respondent was aged 16 to the respondent's occupational grade at age 33 was somewhat smaller at 0.36, but the similarity is striking given that different measures of class are used. Clearly there has been considerable social mobility between grandparents and fathers (where 80 per cent of the variance in father's class at birth is not explained by his grandfather's class), and between fathers and panel members (where 87 per cent of variance is not explained by the father's class).

Parental Support

Parents' aspirations for their child's education were assessed at NCDS1, NCDS2 and NCDS3, and at NCDS3, parents were also asked about their hopes for their child's future employment. The questions concerning educational aspirations varied between sweeps. At NCDS1 parents were asked only whether they would like their child to stay on at school after the minimum school leaving age. At NCDS2 this question was asked again but in addition parents were asked whether they hoped their child would continue education or training after leaving school, and at NCDS3 parents were asked when they wanted the child to leave school and what type of work they hoped their child would end up with.

On the assumption that the two indicators at NCDS2 and NCDS3 would reflect a common factor, the model shown in Figure II was fitted and provided a very good fit to the data. Because there was only a single indicator



Model	$\chi 2$	*df*	GFI
	1.3	4	1.0

Note: Reliability of Age 7 measure fixed at 0.70 in the light of reliabilities found at Ages 11 and 16.

FIGURE II: *Parent's aspirations for their son*

at NCDS1 it was not possible to estimate its reliability, but the reliability of the corresponding indicator at NCDS2 and NCDS3 was approximately 0.70 so the reliability of the NCDS1 indicator was also fixed at this value in subsequent analyses.

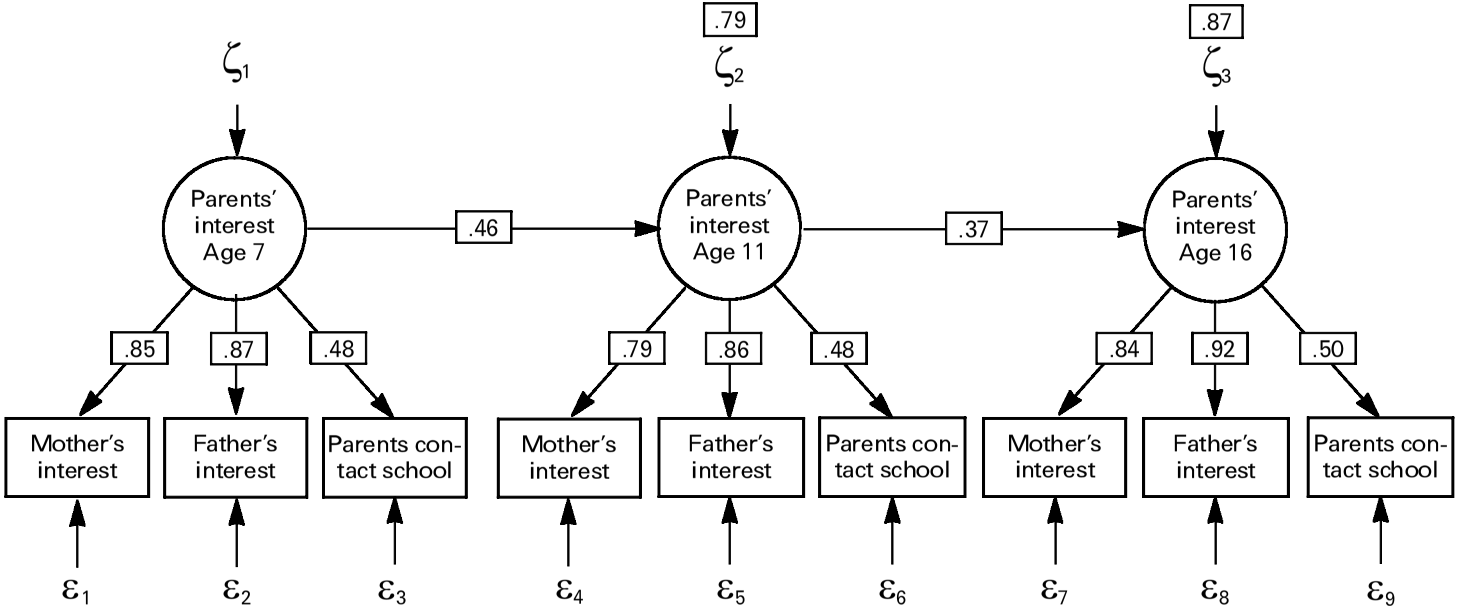
Figure II shows that parental aspirations are highly unstable over time. There is no correlation between aspirations expressed when the child is aged 7 and those expressed four years later, and the stability between ages 11 and aged 16 is only modest. The lack of correlation for the measure when the child is aged 7 is hardly surprising since almost all parents (92 per cent) at that stage want their child to stay on at school. This indicates that parental aspirations wax and wane as children grow up – it may be that parental hopes are modified over time in the light of the child's own development and performance – and it suggests caution in accepting the common assumption that parental aspirations are an enduring factor influencing a child's success.

In addition to data on parental aspirations, we also have measures of parental support and interest. The child's teacher was asked, first, whether the parents had taken the initiative to discuss their child with a member of the teaching staff, and second, to indicate on a 4-point scale for the mother and father separately how interested the parent was in the child's educational progress. These three questions (with minor changes in wording) were asked at NCDS1, NCDS2 and NCDS3, and we have taken them to be indicators of a common factor of parental interest. The model fitted is illustrated in Figure III. With 3 waves and 3 indicators it was possible to test for autocorrelated errors but the model with independent errors provided very little reduction in model fit (as measured by the GFI fit statistic) and so independent errors have been assumed.[13] Since the indicators are essentially the same on all three occasions, it was also possible to examine whether they shared a common factor structure, and this enables the model to be further modified so that the factor loadings for each indicator are constrained to be equal across the three occasions (i.e. a tau-equivalent test model). This also provided an excellent fit to the data which was not much worse than the model where the factor loadings were free to vary, so the model assuming tau-equivalent tests and independent errors was the one adopted for analysis.

Individual Ability and Ambition

There are a number of measures of ability taken between the ages of 7 and 16. NCDS1, NCDS2 and NCDS3 each included maths tests and reading tests. In addition, teacher ratings of ability on a number of dimensions were obtained at NCDS1 and NCDS2, and NCDS3 included a test of general ability consisting of 80 items similar to those used in IQ tests (40 geometric shape items and 40 word items).

Teacher ratings were highly intercorrelated and seemed to reflect a single underlying factor. A principal component analysis of the NCDS1



Model	χ2	*df*	GFI	Δχ2	Δ*df*	ΔGFI
Autocorrelated errors	136.16	16	0.993	–	–	–
Independent errors	227.97	25	0.988	91.81	9	–0.005
Tau equivalent	272.92	29	0.986	44.95	4	–0.002

FIGURE III: *Parents' interest in son's education*

ratings revealed one component accounting for 69 per cent of the variance and, similarly, for NCDS2 ratings one component emerged accounting for 67 per cent of the variance. These ratings have been combined by constructing a factor score for the first principal component (Cronbach alpha for these single scales was 0.89 for both NCDS1 and NCDS2).

The model fitted is shown in Figure IV. Initially, a model with independent errors was fitted but inspection of residuals and modification indices revealed that the covariances across occasions for the reading tests and for the maths tests were higher than the simple general factor model predicted. Model fit was substantially improved by allowing autocorrelated errors for the maths and reading tests, suggesting that there are specific factors as well as a general factor underlying these tests. Model fit was also improved by allowing for the errors for the General Ability Test and maths test at NCDS2 to covary, suggesting that these tests in particular tapped a common analytic ability factor.

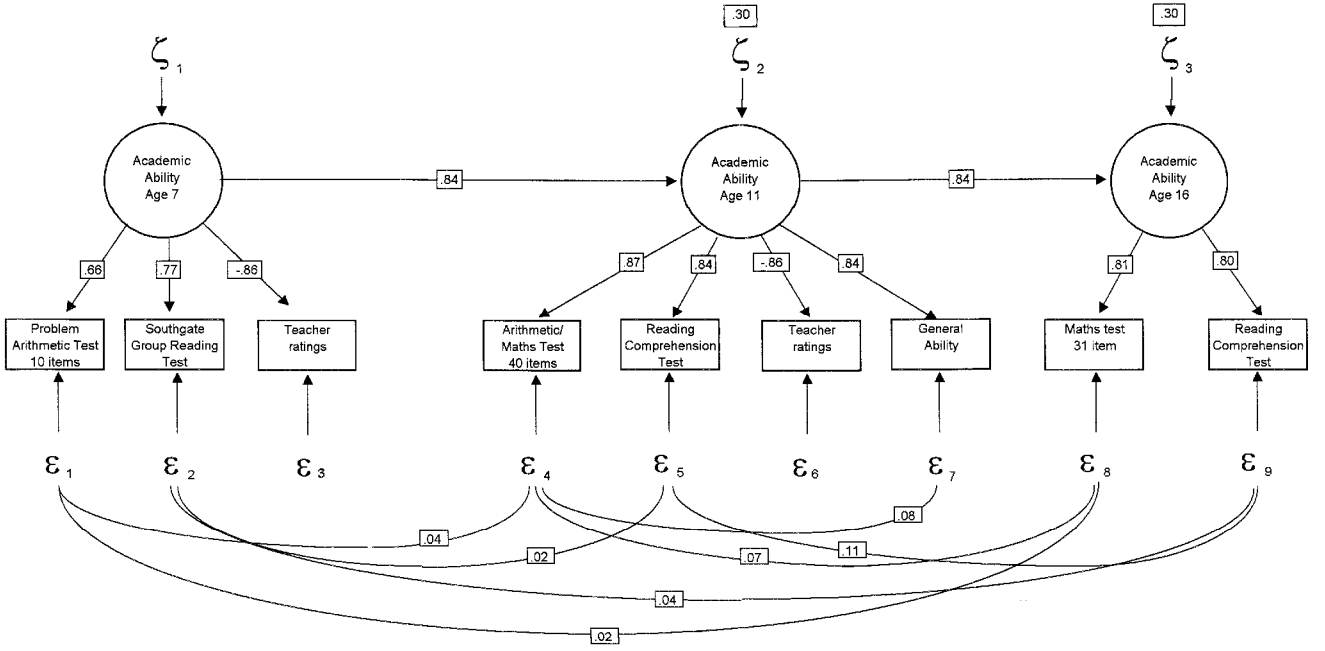
The resulting model provided an excellent fit to the data (GFI = 0.99) and, as Figure IV shows, academic ability is remarkably stable, the stability coefficient being 0.84 between each sweep. This means that 70 per cent of the variance in performance can be predicted from performance four or five years earlier and, over a longer period, performance at age 7 is a strong predictor of performance at age 16, accounting for 50 per cent of the variance.

We also have several measures of panel members' aspirations as they were growing up. Both NCDS2 and NCDS3 asked about the child's educational and job aspirations. At NCDS2 educational and work aspirations were each assessed by a single item, while at NCDS3, educational aspirations were measured by whether they intended to continue with full-time study on leaving school; whether they intended to take A levels; and the age at which they intended to leave school. These items were highly correlated and a principal components analysis revealed one component accounting for 72 per cent of the variance. They were therefore combined into a single factor using factor scores on the first component (Cronbach alpha = 0.76).

Questions about future employment tapped both aspirations (what the children hoped their first full-time job would be) and expectations (what they thought it would be). In both cases, responses were coded to Registrar-General social classes. Aspirations and expectations were highly correlated (the first principal component accounts for 86 per cent of the variance) and were therefore combined by constructing factor scores on the first principal component (Cronbach alpha = 0.84).

The model for the respondent's aspirations and expectations as a child is shown in Figure V. It provides an excellent fit to the data and the factor loadings for job and educational aspirations are broadly comparable. Stability in aspirations between age 11 and 16 is moderate at 0.5.

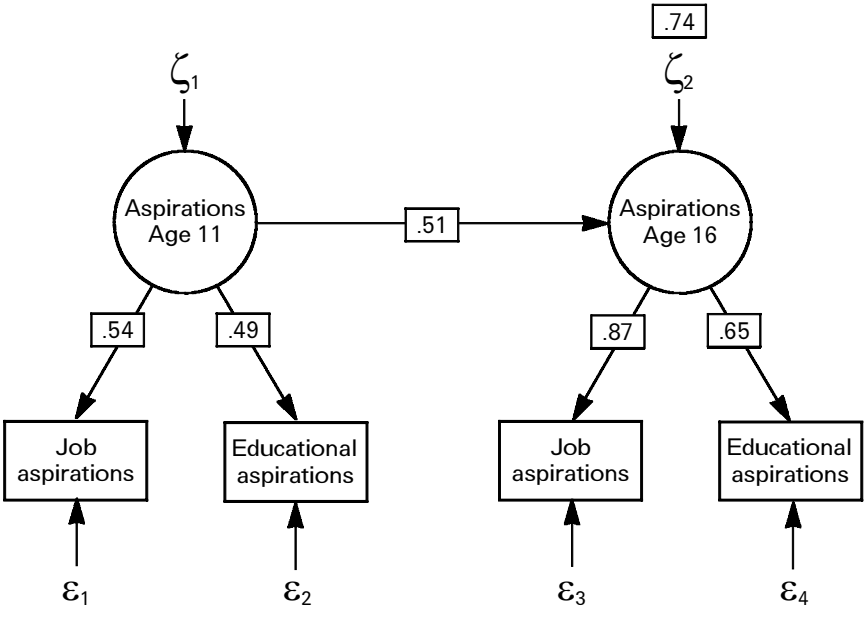
In addition to measuring their aspirations while still at school, we can also assess their motivation. NCDS3 included an Academic Motivation Scale consisting of responses to eight statements, each rated on a five point scale.



Teacher Ratings (on 5 point scale)		
	AGE 7	AGE 11
	Reading	Use of books
	Number Work	Number Work
	Oral Ability	Oral Ability
	Awareness of world	General knowledge
First PC	69%	67%
Cronbach Alpha	0.89	0.89

Model	$\chi 2$	*df*	GFI	$\Delta\chi 2$	Δdf	ΔGFI
Independent errors	980.28	25	0.949	–	–	–
Correlated errors	201.33	18	0.990	778.95	6	0.041

FIGURE IV: *Academic ability*



Model	χ2	*df*	GFI
	0.3	1	1.0

Factor scores

Job apirations (2 items):
- Hopes for Class I/II job
- Expects Class I/II job

First PC: 86% of variance
Cronbach Alpha = 0.84

Educational aspirations (3 items):
- Expectation about school leaving age
- Whether want to take 'A' levels
- Whether intends full-time study after school

First PC: 72% of variance
Cronbach Alpha = 0.76

FIGURE V: *Respondent's aspirations as a child*

Teachers also rated the children on whether they were 'unresponsive, inert or apathetic' (on a 3-point scale) and on a 5-point scale ranging from 'lazy' to 'hardworking'. These two teacher ratings have been combined by constructing factor scores on the first principal component (which accounted for 76 per cent of the variance; Cronbach's alpha = 0.58). Motivation at school can also be gauged by truancy and absenteeism records. These are measured by two teacher reports (one on truancy, the other on absence from school for trivial reasons), and by a parent report. The first principal component for these three variables accounted for 66 per cent of the variance and factor scores on this component were constructed (Cronbach's alpha=0.73).[14]

The Academic Motivation Scale (factor loading = 0.56), the combined

teacher ratings (–0.77) and the truancy factor (0.62) all load highly on a single factor, although the adequacy of fit could not be tested since with three indicators on one occasion the factor model is just identified. Nevertheless, the single factor model has been assumed in the construction of our model.

Qualifications

The examination results achieved by panel members while still at school have been coded according to a 10-point scale ranging from no qualifications to 9 or more points in GCE A levels or Scottish Highers. We also have information on further qualifications achieved since leaving school, and these are coded to the highest qualification achieved on a five point scale corresponding to the five levels of National Vocational Qualifications (NVQs).

THE PATH MODEL

As recommended by Anderson and Gerbing (1988), Hayduk (1987), Herting and Costner (1985) and Joreskog (1993), we first developed measurement models for each of the latent constructs, and then fitted the structural model. Polychoric correlations were computed for relationships involving the ordinal social class background measures, and, given that the data would not be multinormally distributed, and that sample size was large, we used the asymptotically distribution-free (ADF) fit function for the model (Browne 1984; Hu, Bentler and Kano 1992). Thus, having first determined the appropriate measurement model for each construct independently, the measurement model for all constructs simultaneously was estimated[15] and a series of nested structural models was fitted to determine the most parsimonious fit to the data.[16]

Table I summarizes the fit statistics for these models. The difference chi-square statistics were statistically significant in each case, and therefore the additional contraints introduced at each step resulted in a significantly worse fit. Nevertheless, both fit indices, GFI and CFI, reveal that each model fits the data very well, and the difference between the final model and the initial measurement model is modest. The fit statistics for the final model (which are all greater than 0.965) are greater than typically found in structural linear equations modelling and are well above the threshold of 0.90 which most investigators regard as acceptable.

The final structural model for the relationships between the constructs is shown in Figure VI. In order to simplify presentation, the measurement model for each construct is omitted, as are the disturbance terms.

Only four measures have a *direct effect* on occupational success at age 33 – qualifications gained from secondary education, additional qualifications, motivation at school at age 16, and academic ability at age 11. There are no

TABLE I: *Hierarchical tests of nested models*

Model	$\chi 2$	*df*	GFI	CFI	$\Delta\chi 2$	Δdf	ΔGFI
1. Measurement model	2297.28**	625	0.984	0.979			
2. Recursive model, no 'illogical' effects	2375.19**	647	0.984	0.978	77.91**	22	0.00
3. Model 2 + eliminate psychological variables having lagged effects on structural variables	2471.23**	681	0.983	0.977	96.04**	34	0.00
4. Model 3 + eliminate lag-2 effects	2887.38**	792	0.980	0.974	416.15**	111	0.00
5. Model 4 + eliminate nonsignificant effects except stability coefficients	3236.55**	881	0.978	0.970	349.17**	89	0.00
6. Model 5 + eliminate $\beta < .09$	3705.89**	914	0.975	0.965	469.34**	33	0.00

Note: $^{**}p < .01$

direct paths from parental class, nor from any of the variables associated with class advantage and disadvantage (e.g. housing, type of school, parental interest and parental aspirations). To the extent that these social background factors have an impact, it is *mediated entirely through their effects on the ability and ambition of the child.* This is crucially important for two reasons.

First, the absence of any direct path from parental class to occupational status at age 33 demonstrates that there are no further features associated with class origins which could be influencing occupational success to any significant extent other than those already included in the model. If, as is often suggested, 'class advantages' such as a middle-class accent or access to middle-class networks were important in themselves in influencing job outcomes, this would show up in a direct path from parental class to class destination at age 33, but there is no such path. Everything that is important about social background is therefore already in the model.

Secondly, it indicates that social background is only important given the effect that it has on the child's own character and performance. To the extent that middle-class origins are a help in life, it is because they augment individual talent and/or ambition, not because they provide a legacy of other advantages unrelated to the child's own ability to succeed.

Table II summarizes the direct, indirect and total effects represented by the various pathways identified in Figure VI. Not surprisingly, school and further qualifications directly affect occupational grade, the latter having a somewhat greater influence. [17] Qualifications achieved at school are mainly a result of ability and ambition – direct effects are found for both ability (at age 11 and at age 16), and for child's aspirations and motivation at school at age 16. The only other significant influence on school qualifications is

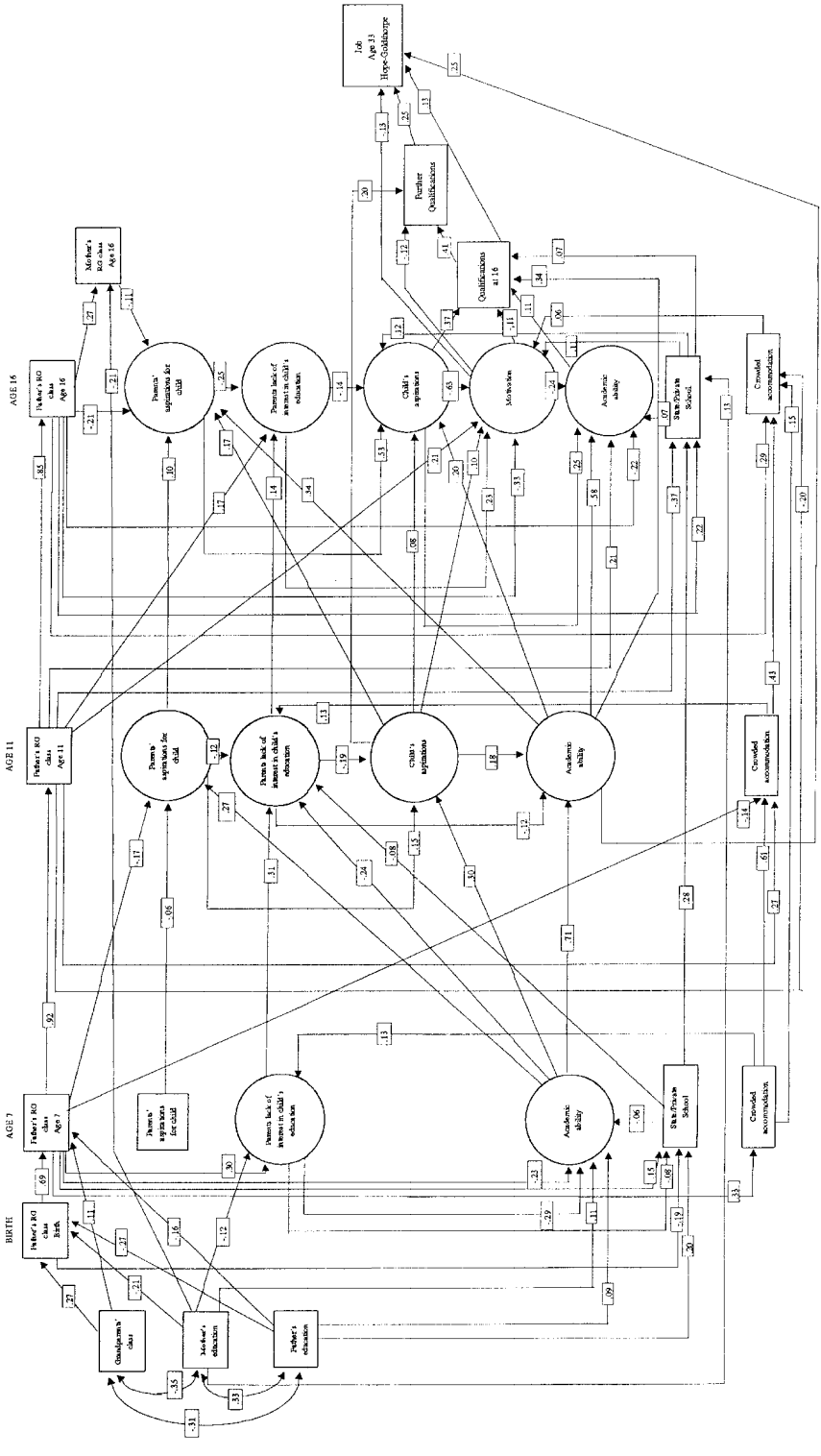


FIGURE VI: *Standardized structural model for economically active men (N = 4,298)*

TABLE II: *Total, direct and indirect effects on occupational status at age 33*

Age	Variable	Standardized total effect	Standardized direct effect	Standardized indirect effect	Effect size total effect	Effect size direct effect	Effect size indirect effect
Birth	Grandparents' class	–0.05		–0.05	–0.11	0.00	–0.11
Birth	Mother's education	0.09		0.09	0.23	0.00	0.23
Age 7	Father's education	0.09		0.09	0.24	0.00	0.24
Birth	Father's class	–0.12	0.00	–0.12	–0.28	0.00	–0.28
Age 7	Father's class	–0.18	0.00	–0.18	–0.38	0.00	–0.38
Age 11	Father's class	–0.03	0.00	–0.03	–0.07	0.00	–0.07
Age 16	Father's class	0.03	0.00	0.03	0.06	0.00	0.06
Age 16	Mother's class	–0.01	0.00	–0.01	–0.04	0.00	–0.04
Age 7	Crowded accommodation	–0.03	0.00	–0.03	–0.03	0.00	–0.03
Age 11	Crowded accommodation	–0.02	0.00	–0.02	–0.02	0.00	–0.02
Age 16	Crowded accommodation	–0.01	0.00	–0.01	–0.01	0.00	–0.01
Age 7	Private School	–0.01	0.00	–0.01	–0.12	0.00	–0.12
Age 16	Private School	0.02	0.00	0.02	0.14	0.00	0.14
Age 7	Parent's aspirations	0.00	0.00	0.00			
Age 11	Parent's aspirations	0.04	0.00	0.04			
Age 16	Parent's aspirations	0.13	0.00	0.13			
Age 7	Parents' interest in child's education (lack of)	–0.14	0.00	–0.14			
Age 11	Parents' interest in child's education (lack of)	–0.09	0.00	–0.09			
Age 16	Parents' interest in child's education (lack of)	–0.07	0.00	–0.07			
Age 7	Academic ability	0.39	0.00	0.39			
Age 11	Academic ability	0.43	0.25	0.18			
Age 16	Academic ability	0.03	0.00	0.03			
Age 11	Child's aspirations	0.15	0.00	0.15			
Age 16	Child's aspirations	0.21	0.00	0.21			
Age 16	Lack of motivation	–0.19	–0.13	–0.06			
Age 16	Qualifications	0.23	0.13	0.10	0.11	0.06	0.05
Age 33	Additional qualifications	0.25	0.25	0.00	0.18	0.18	0.00

the direct path from type of school, indicating that those attending private school at 16 gain better qualifications than those attending state schools, independently of their ability and ambition (the unstandardized path coefficient here is 0.91). We shall consider the influence of private schooling later.

Post-school qualifications are also affected by ambition, but there are no direct effects from ability. The largest path is from the qualifications gained from secondary education, reflecting the fact that those who do well at school will tend to go on and gain further qualifications. The other direct paths are from motivation at school at age 16 and from aspirations at age 11. This suggests first, that motivated individuals tend to do well at school *and* have the drive to go on to do further qualifications, and secondly, that individuals who were ambitious before puberty, but whose motivation wanes during adolescence, may recover the drive to succeed after leaving school and sign up for further education or training.

Figure VI shows that *ability* has an independent effect on job success, over and above its effect through success at school. This suggests that bright individuals not only achieve better qualifications at school, but also outperform less able contemporaries after entering the labour market. This *continuing* importance of ability in influencing class destinations has been overlooked by previous researchers, such as Marshall and Swift (1996), who have claimed to have controlled for the effects of ability simply by controlling for formal qualifications.

Interestingly, it is ability at age 11 rather than at age 16 which has a direct effect on occupational status at age 33. Measures of ability at age 11 included a test of general ability and teacher ratings, as well as reading and maths tests, whereas at age 16, only maths and reading test scores were used. The measures at age 11 therefore capture an element of IQ, whereas those at 16 are somewhat narrower. The direct link from ability at age 11 may therefore indicate that broader aspects of intelligence have an effect on job status over and above the association with academic ability and formal qualifications.

Although the model outlined in Figure VI shows ability as being shaped in part by parental involvement, the lagged effects for ability revealed by the analysis show that these variables are dynamically related. Parents' aspirations and interest in their child's education are both raised if they have able children, and doing well academically also raises the child's own aspirations. Thus, lagged effects were found from ability at age 7 to parents' aspirations, parents' interest in education and child's aspirations at age 11, and from ability at age 11 to parent's aspirations and child's aspirations at age 16.

Individual *ambition* is also important in influencing occupational attainment. The independent effect of ambition is manifested both in the direct path from the child's motivation score at 16 to his occupational status at 33, and in the strong indirect path from the child's aspirations at age 16 through motivation and hence on to occupational status. While ambition

and ability have their own independent effects on occupational achievement, they also affect each other. Lagged effects for ability on aspirations, from age 7 to age 11 and from age 11 to age 16, indicate that the mere fact of being bright tends to encourage children in their aspirations. Equally, at both 11 and at 16, aspirations affect academic ability – those with ambition subsequently do better in tests. Clearly, then, ability and ambition reinforce each other in a virtuous – or vicious – cycle through the school years.

If the meritocratic measures of ability and motivation clearly influence occupational grade, so too do other factors to do with upbringing. *Parental aspirations* do not directly affect the occupational grade achieved by panel members, but they do influence the child's aspirations and, as we have seen, these then have an important impact on motivation and subsequent qualifications. They also affect *parents' interest and involvement in their child's education* at both age 11 and age 16. Parents' aspirations when the child was aged 7, however, had no effects on anything – they do not even predict parent's aspirations four years later. This is mainly because, when their children are young, virtually all parents (92 per cent) say that they would like them to stay on at school past the minimum leaving age, and it is only later that parental aspirations diverge. The path from the child's ability at 7 to the parents' aspirations for the child at 11 suggests parental aspirations tend to wane among those parents whose children turn out to be less able – parents begin to anticipate their child's future academic performance on the basis of their early performance, and they trim their aspirations accordingly.

It is interesting to speculate on the reasons why parental interest in the child's education should affect ability test scores in the first eleven years of the child's life (especially given that parental aspirations have no such effect). One possibility is that parents who take the trouble to visit the school and who show an active interest in their child's educational development are also likely to help and encourage the child at home, and this will show up in higher reading and math scores, especially in the early years. Another possibility is that intelligent parents will be more interested in education and will also be more likely to produce intelligent offspring (the model lacks any measure of parental intelligence, so on this interpretation, parental interest in education is operating as an indicator of it). The paths at ages 7 and 11 from parental interest to child's ability would not, on this second interpretation, necessarily indicate direct causation, but would simply be a function of the fact that brighter parents tend to produce brighter children. In all probability, both of these explanations have something to offer, and we should not jump to conclusions (one way or the other) regarding 'nature' and 'nurture' simply from the presence or absence of paths in the diagram.

What of social background factors? At age 7, the effects of *private schooling* appear unimportant, but this may be because so few children attended private schools at age 7 and the variance is therefore small. For this reason, we have retained coefficients with small standardized values so as not to

overlook any impact which private schooling may be having, but this can result in retention of paths which should probably be deleted. A case in point is the path from private schooling at 7 to ability at 7, for not only is the coefficient small, it is also (rather implausibly) negative! In a parallel analysis using a maximum likelihood rather than ADF solution the effect was found to be positive, but either way it is clearly an unreliable result and little significance should be attached to the existence of this path. The other effect of schooling at age 7 is a lagged effect on parental interest at age 11 – parents whose children attend private school will subsequently take more interest in their child's education. Again, however, the effect is small.

It is at 16 that private schooling has more important effects. In earlier work on this data set, Saunders (1997) showed that private education is significant in reducing the chances of downward mobility of less able middle-class children. We can now see how this effect comes about. By age 16, private school pupils have higher aspirations, better motivation at school, higher academic ability and go on to achieve higher qualifications than their equivalents at state schools. Although the standardized coefficients are all small (for the reasons outlined above), the effect sizes indicate that the independent impact of private schooling is, in Cohen's (1988) terms, around a 'medium size' (the unstandardized coefficients are 0.70 for the child's aspirations at 16, 0.64 for motivation at 16, 0.42 for qualifications obtained, and 0.40 for measured ability). It seems that private schools do have an impact on the children who attend them, partly by raising their academic performance, but more especially by increasing pupil motivation and ambition. Parents who pay for their children to be privately educated may, therefore, be correct in believing that private schools are more successful than state schools in encouraging pupils to aim high and fulfil their potential.

Overcrowding in the home has only one direct effect (and this is much less marked at 16 than at 7 and 11) and that involves an influence on parental interest in the child's education. Parents who live in relatively crowded accommodation tend to take less interest in their child's education, even allowing for the association of both variables with the father's social class. This may reflect size of family rather than the quality of the physical environment – those with many children have less time to take an interest in the education of any one of them. Alternatively, this path may be evidence for some sort of 'culture of poverty' among an 'underclass' or a subsection of the working class where material deprivation (indicated by overcrowding) produces cultural deprivation (indicated by a lack of interest in education) which in turn inhibits the child's later performance at school and in the labour market. Work by Alan Buckingham (1999) investigates this issue in more detail.

Apart from its links to private schooling and overcrowded housing, social class origin is also associated with parental support and aspirations. The higher the father's class, the higher the parents' aspirations. At age 16, there was a synchronous relationship between the two variables, while at

younger ages, the relationship was a lagged relationship between father's class at age 7 and parental aspirations at age 11 (possibly because parent's aspirations at age 7 are a poor predictor). Higher class parents also show stronger interest in the child's education – a direct relationship was found at age 7 and a lagged relationship at age 16, although there was no direct effect of social class on parent's interest at age 11.

Parental class also has direct effects on academic ability at age 7 and at age 16.[18] Again, we need to remember that these findings could support either an environmental or biological explanation of ability. A middle-class background may generate higher ability scores, either because children from higher-class backgrounds enjoy more social and cultural advantages (over and above parental aspirations and interest in education), or because they inherit more innate ability from their already successful parents. Similarly, the fact that a father's subsequent upward mobility does not have much effect on the child's later ability scores could be because the child's innate ability is uninfluenced by improvements in the class background of the parents, or it could be because the environmental impact on ability occurs mainly in the early years of life.

Social class also has direct effects on motivation at school at age 16, although the presence of both synchronous and lagged effects makes the interpretation more complicated. The lagged effect is positive indicating, as expected, that a higher class background produces more motivated children. The synchronous effect is negative indicating that the children of upwardly mobile fathers are more motivated than those of downwardly mobile fathers. The fact that there is a direct effect on motivation at 16 (as well as an indirect effect through parental aspirations) suggests that class-based peer groups may be having some influence.

The independent effects of other social class indicators – the mother's class, each parent's own class origins, and each parent's educational background – were negligible. Mother's class, assessed when the child was 16, had an effect only in reinforcing parents' aspirations. The parents' own class background had no effects on the child other than through the influence on the class which the father himself occupied – an interesting finding which demonstrates that children from first-generation middle-class homes are no less likely to succeed than those from more established middle-class lineages. Parents' educational histories had few direct effects (other than influencing the parents' own class destinations). There was a small positive effect of father's education on the child's academic ability at age 7, and mother's education had a modest effect on parent's interest in their child's education. Other than these, the main effects of parents' education were on the likelihood that they would send their child to private school. Private schooling, in other words, is chosen by parents who are middle-class and who are well-educated.

The key point about the influence of class background on occupational destinies is that it is mediated almost wholly through the child's own ambition and ability (the only exception is the path via private schooling, but

TABLE III: *How effects are mediated by ability and ambition: Decomposition of indirect effect on occupational status at age 33*

		Effects through ability		Effects through ability and not ambition		Effects through ability and ambition		Effects through ambition		Effects through ambition and not through ability		Effects not through ability and/or ambition	
Age	Variable	Standardized effect	% total effect	Standardized effect	% total effect	Standardized effect	% total effect	Standardized effect	% total effect	Standardized effect	% total effect	Standardized effect	% total effect
Birth	Father's class	–0.095	79	–0.061	51	–0.034	28	–0.057	47	–0.023	19	–0.002	2
Age 7	Father's class	–0.143	80	–0.093	52	–0.051	28	–0.084	47	–0.033	19	–0.002	1
Age 11	Father's class	–0.003	10	–0.001	3	–0.002	7	–0.030	88	–0.028	82	–0.003	8
Age 16	Father's class	–0.005	18	–0.005	20	0.000	2	0.027	106	0.027	104	0.004	14
Age 16	Mother's class	–0.001	5	0.000	0	–0.001	5	–0.014	100	–0.013	95	0.000	0
Age 7	Crowded accommodation	–0.023	76	–0.015	49	–0.008	27	–0.015	51	–0.007	24	0.000	0
Age 11	Crowded accommodation	–0.009	54	–0.005	33	–0.003	21	–0.011	67	–0.007	46	0.000	0
Age 16	Crowded accommodation	0.000	3	0.000	0	0.000	3	–0.011	100	–0.010	97	0.000	0
Age 7	Private School	–0.019	169	–0.013	114	–0.006	54	–0.003	27	0.003	27	0.005	42
Age 16	Private School	0.002	10	0.002	7	0.001	2	0.005	21	0.004	18	0.016	72
Age 7	Parents' aspirations	–0.001	45	0.000	11	–0.001	34	–0.002	89	–0.001	55	0.000	0
Age 11	Parents' aspirations	0.020	44	0.005	11	0.015	34	0.040	89	0.025	56	0.000	0
Age 16	Parents' aspirations	0.006	5	0.000	0	0.006	5	0.131	100	0.124	95	0.000	0
Age 7	Parent's interest in child's education (lack of)	–0.132	94	–0.087	62	–0.045	32	–0.052	38	–0.007	5	0.000	0
Age 11	Parent's interest in child's education (lack of)	–0.067	75	–0.041	46	–0.026	29	–0.048	54	–0.023	25	0.000	0
Age 16	Parent's interest in child's education (lack of)	–0.003	4	0.000	0	–0.003	4	–0.073	100	–0.070	96	0.000	0

Contd.

TABLE III: *contd.*

Age 7	Academic ability	0.387	100	0.258	67	0.129	33	0.129	33	0.000	0	0.000	0
Age 11	Academic ability	0.183	42	0.346	80	–0.164	38	0.088	20	0.252	58	0.000	0
Age 16	Academic ability	0.025	100	0.025	100	0.000	0	0.000	0	0.000	0	0.000	0
Age 11	Child's aspirations	0.078	53	0.000	0	0.078	53	0.146	100	0.068	47	0.000	0
Age 16	Child's aspirations	0.010	5	0.000	0	0.010	5	0.212	100	0.201	95	0.000	0
Age 16	Lack of motivation	–0.006	3	–0.126	68	0.120	64	–0.061	32	–0.181	97	0.000	0
Age 16	Qualifications	0.000	0	0.000	0	0.00	0	0.000	0	0.000	0	0.233	100
Age 33	Additional qualifications	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.248	100

the impact of class background via this path is negligible). This is most clearly revealed in Table III which decomposes the indirect effects of each variable in the path diagram into those that go through at least one of the ability measures, those go through at least one of the ambition measures, and those that go through neither an ability or ambition measure. These are calculated using the method of identifying specific effects discussed by Bollen (1989: 383–9; see also Hayduk 1987, Greene 1977, and Fox 1985).

It is clear from Table III that the effect of class background on occupational status is mainly felt in the early years (the measures taken at birth and at age 7 had the largest total effects, subsequent measures adding little), and is mediated largely through the ability of the child. Half of the total effect of early class origins was by paths which involved ability but not ambition measures, and a further 28 per cent was by paths which involved both ability and ambition. Only 19 per cent were by paths involving ambition but not ability variables. The impact of class background later in childhood – at ages 11 and 16 – was more through ambition, but the size of these effects is small.

Table III also enables us to understand better the effects of other variables in the model. We saw earlier, for example, that private schooling at 16 has a stronger impact on children's aspirations and motivation than on their qualifications and measured ability. However, when it comes to influencing occupational status at 33, a private education is mainly important because of its influence on the achievement of better qualifications (72 per cent of the impact of private schooling on occupational attainment is through the achievement of higher qualifications), and most of the remainder (18 per cent) is through raising children's ambitions.

We can also use Table III to sort out further the way parental aspirations on the one hand, and parental interest in education on the other, affect children's occupational destinies. Parental aspirations are important mainly because they raise children's ambition – at age 11, 89 per cent of the impact of parents' aspirations is achieved through the higher ambition it produces in their children, and by 16, the whole of it is channelled through this route. Parental interest in their children's education is, by contrast, mainly important through its influence on children's ability, although this effect declines as the child grows older. At age 7, 96 per cent of the impact which parental interest will have on the child's eventual destination is achieved through its influence on the child's measured ability, but by 11 this has fallen to 75 per cent and by 16 the effect is almost wholly through ambition.

We have seen that for this sample of 33 year-old men, ability has by far the largest total effect on their occupational attainment, even when it was assessed as early as seven years of age. The total effects of ability are nearly twice as great as those of qualifications, and are more than twice as great as those of individual ambition. The effects of social background – parental class, parental aspirations, parental interest in education – are strikingly modest.

TABLE IV: *Variance accounted for in occupational status at age 33*

Age	Variable	Variance accounted for	Variance accounted for by category of predictor	% variance accounted for
Class background				
Birth	Father's class	3.28		
Age 7	Father's class	2.68		
Age 11	Father's class	0.04		
Age 16	Father's class	0.04		
Age 16	Mother's class	0.04	6.07	0.03
Housing				
Age 7	Crowded accommodation	0.18		
Age 11	Crowded accommodation	0.03		
Age 16	Crowded accommodation	0.02	0.23	0.00
Type of School				
Age 7	Private school	0.02		
Age 16	Private school	0.10	0.12	0.00
Parents' aspirations				
Age 7	Parents' aspirations	0.00		
Age 11	Parents' aspirations	0.40		
Age 16	Parents' aspirations	2.31	2.71	0.01
Parents' interest in child's education				
Age 7	Parents' interest in child's education (lack of)	3.68		
Age 11	Parents' interest in child's education (lack of)	1.22		
Age 16	Parents' interest in child's education (lack of)	0.98	5.87	0.03
Academic ability				
Age 7	Academic ability	25.68		
Age 11	Academic ability	10.57		
Age 16	Academic ability	0.03	36.27	0.17
Ambition				
Age 11	Child's aspirations	3.60		
Age 16	Child's aspirations	3.77		
Age 16	Lack of motivation	4.07	11.43	0.05
Qualifications				
Age 16	Qualifications	4.19		
Age 33	Additional qualifications	8.99	13.17	0.06
Variance explained		75.89		0.35
Total variance		218.96		1.00

Table IV shows the proportion of variance in occupational status which is explained by each predictor variable. The variances are independent – that is, they sum to the total variance explained – so the variance attributed to

each variable is that independent of any prior causal variables. This table confirms that ability is by far the most important factor in this model. The three ability measures in total account for 17 per cent of the variance in occupational status, or for 48 per cent of the explained variance. Qualifications account for 6 per cent and ambition counts for 5 per cent. The social class variables together account for only 3 per cent of the variance in total (8 per cent of the explained variance). Parents' aspirations account for 1 per cent, parents' interest in their child's education accounts for 3 per cent, and the impact of housing and type of school are each less than 1 per cent.

CONCLUSION

On the basis of these findings, we can provide an answer to why some individuals succeed in achieving a higher occupational grade than others. Class background is a small part of the explanation (but only in so far as it has some minor influence on ability and motivation). Good parenting also helps (but again, only because it strengthens ability and motivation). For the most part, insofar as we can explain it all (and our model only explains 35 per cent of the variance), individual success and failure appears to be the result of individuals' own characteristics and attributes – their motivation, their pursuit of qualifications and, above all, their ability – and these cannot be explained away as class background effects. The key influences on occupational destinies are, as the meritocracy thesis suggests, individual talent, hard work, and the determination to succeed.

(Date accepted: January 1999)

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NOTES

1. Writers in this tradition have very recently begun to address the question of why some individuals succeed more than others – see Savage and Egerton (1997) and Breen and Goldthorpe (1997) – but they continue to eschew the use of path models, preferring to retain analysis based on odds ratios. This results in the use of very crude measures of key concepts (ability, for example, has to be analysed in broad bands rather than on a continuous scale), but in spite of this, both of these studies end up acknowledging that 'over-representation' of middle-class children in middle-class jobs has something to do with class differences in average ability levels. We shall address this new work in the class structurationist tradition in more detail in a later paper.

2. We believe this conclusion is unreliable, for not only does this study lack an adequate measure of ability, but the correlation of 0.57 between 'ability' (measured by O-level scores) and 'schooling' (measured in years) indicates collinearity.

3. Gordon Marshall claims that he and Adam Swift *have* collected data on ability, but it turns out that they have only collected information on educational qualifications. As one of us has shown elsewhere, however, and as Kerckhoff's 1990 study also shows, ability cannot adequately be measured by educational qualifications, and it continues to exert an independent effect on occupational achievement even after completion of full-time education. See Marshall and Swift (1996) and Saunders (1997).

4. It is something of a paradox that critics complain that this work is 'functionalist' when they also complain that it is not 'structuralist'!

5. This pattern of under-representation is likely to bias estimates of the degree of upward mobility (for we can assume that many of those lower class and low ability individuals who have dropped out of the panel have not achieved upward mobility). Correlations will be slightly attenuated due to restriction of range, but the implications for a complex structural model are more difficult to gauge.

6. This procedure has also been used by Kerckhoff (1990) in his analysis of NCDS4 data and is unlikely to bias the coefficients in the structural model to any great extent.

7. The Hope–Goldthorpe scale is the best-known scale of occupational prestige in Britain. It does have some disadvantages as compared with the Cambridge scale (Stewart et al. 1980): e.g. the Cambridge scale avoids the problem of an implicit moral consensus over the evaluation of occupations, and it takes account of typical patterns of career progression over time. Nevertheless, the Hope–Goldthorpe scale has the advantage of familiarity, and the logic of a hierarchy of occupational prestige is readily understandable. Given that the Cambridge scale correlates highly ($r = 0.88$) with the Hope–Goldthorpe scale, and that we have run regression models using both scales and have achieved much the same results, we suggest that in practice it makes little difference which of these two measures we adopt.

8. We have not analysed differences between types of state secondary school because, by 1974, most secondary state education had been reorganized along comprehensive lines. Only 12% of NCDS panel members attended grammar schools with a fifth at secondary modern schools. It is worth noting that previous research has often combined selective state schools and private schools in a single measure and have then shown how a 'privileged' education can influence later success (e.g. Halsey et al. 1980; Kerckhoff 1990). This is unhelpful in our view, for entry to state grammar schools was based on tests of ability while private schooling is generally available only to those willing and able to pay fees. Combining the two thus confounds key measures of the meritocracy and SAD theses.

9. Housing conditions were also measured by access to 5 basic amenities at sweeps 1 to 3, but this had little predictive value for other variables in our model and has therefore been dropped from the analysis that follows.

10. We would justify this on the grounds that on income, job security, autonomy, authority and prestige, professional/managerial jobs score higher than routine white-collar/skilled manual jobs which in turn rank higher than semi- and unskilled manual workers (who tend to score 'low'). Ideally, of course, we would like to use the Hope–Goldthorpe scale rather than Registrar-General class categories, but occupational data in the early NCDS sweeps are not coded in this way, so we are obliged to use a categorical schema. We use the Registrar-General classification rather than the Goldthorpe one because Goldthorpe insists that his class schema is not hierarchical, except for the division between the 'service class' and the rest, which means we would be obliged to treat class as a simple dichotomous variable. In our view, this would have meant blunting the very real differences of income, status and responsibility which exist between skilled- and white-collar employees on the one hand, and semi- and unskilled manual workers on the other, and would therefore have risked reducing the predictive power of the class variable. The only other alternative would have been to enter each Goldthorpe class category separately as a dummy variable, but this would have generated so many variables that the analysis would have become exceedingly

complex making interpretation of the results almost impossible.

11. The model where reliability is assumed to be 1.0 and where a lag-1 autoregressive structure was assumed provided a poor fit. To have retained the assumption of perfect reliability, improving the fit to an acceptable level would have required introducing lag-2 and lag-3 relationships.

12. Some caution is needed here since changes in the occupational structure mean that the maximum R^2 will be less than 1.0.

13. Given the length of time between sweeps, the change of school between NCDS2 and NCDS3, and the change of teacher between sweeps, it is not perhaps surprising that errors are not strongly correlated.

14. The child's self-reported truancy is also recorded in NCDS3, but it correlates poorly with the other indicators and has therefore been omitted. Similarly, a measure of overall school attendance did not correlate highly either, presumably because it combines absences for good reason (e.g. illness) with truancy or trivial absences and does not therefore provide a good measure of the child's motivation.

15. The reliability of constructs measured by a single indicator cannot be estimated, and in these cases we have assumed a measure of reliability (and fixed its error variance accordingly) rather than assuming no measurement error (Hayduk 1987, Anderson and Gerbing 1988). A value of 0.64 for mother's and grandfather's social class was derived from that for father's social class (as explained above). A value of 0.70 for parents' aspirations in NCDS1 was estimated for the corresponding indicator at ages 11 and 16 (where multiple indicators enabled an estimate to be made). The values for mother's and father's education, schooling, crowded accommodation, exam results and job status are based on our judgments of likely values.

16. All models fitted were recursive and assumed independent disturbance terms. Although both of these assumptions are questionable in panel studies, inspection of modification indices (Joreskog and Sorbom, 1989) suggests that in this case such assumptions are reasonable.

The series of nested structural equation models was developed as follows. First, constraints reflecting the appropriate developmental sequence for each construct were introduced which in most cases gave an autoregressive model, and certain implausible lagged effects between demographic indicators were eliminated. Second, 'individual' variables (parental aspirations and interest in the child's education, and the child's ability and ambition) were not allowed to have lagged effects on the demographic indicators. Third, all lag-2 effects were eliminated. Fourth, all non-significant effects were eliminated, except those which gave stability coefficients reflecting an association between the same construct measured at different points in time. Fifth, because the sample size is very large and standard errors are correspondingly small, we could not accept all statistically significant relationships as substantively significant, and this meant deleting statistically significant relationships below a given threshold value. This value was determined in one of two ways, depending on the type of measure. For derived measures relating to parents and to panel members, only paths with a standardized coefficient of 0.09 or higher were retained. For demographic variables, however, reliance on standardized values could have resulted in deletion of paths simply because of small variances in the variables themselves (the social class variables, for example, have only 3 values), and in these cases, raw coefficients are more meaningful. Cohen (1988) suggests that, in social science, an effect size of one-quarter of a standard deviation represents a 'small' effect, and one of one-half represents a 'medium' effect. We have taken Cohen's criterion of a 'small' effect as the criterion for binary variables, and for those with a higher number of values, we have taken a higher proportional threshold point.

17. This supports Kirchoff's view that further education is particularly important in Britain, and that earlier path models which have included only schooling variables have therefore under-estimated the significance of qualifications in influencing job attainment – see Kirchoff (1990).

18. There was also a lagged effect of

class on academic ability at age 16, which shows that where the father is socially mobile, the child's academic ability is better predicted by the class of the father when the child was young than with his class when the child reached its teens.

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