Secular Changes in the Association of Parental Divorce and Children's Educational Attainment – Evidence from Three British Birth Cohorts

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ABSTRACT

This article examines the secular trends in the overall association of parental divorce (or separation) and children's educational attainment at school-leaving age during the period spanning a quarter of a century since the second world war in Britain. The study presents a reanalysis of data from the three British birth cohorts which studied children born in 1946, 1958 and 1970. Equivalent educational attainment at the different time points is defined relative to the population distribution at the time, using the median level. The relative risks (with 95 per cent confidence intervals) of lower than median educational attainment associated with parental divorce (or separation) are 1.3 (1.2 to 1.5), 1.4 (1.3 to 1.5) and 1.4 (1.3 to 1.5) for the three cohorts respectively. These results refute the commonly held opinion that the effects of divorce on children have attenuated with the increasing prevalence of divorce.

INTRODUCTION

It has been often suggested that the impact of divorce for children may be reduced as divorce rates rise and the experience has become more commonplace (Amato and Keith, 1991; Rodgers, 1996; Richards, 1996): a position we shall refer to as the reduced effect hypothesis. The possible

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processes through which this might operate are a reduction in the stigma associated with divorce, an increasing awareness of parents of the potential problems for children, a growing emphasis on both parents remaining in contact with children after separation and the availability of services to assist parents with the post-divorce arrangements for children.

Amato and Keith (1991) conducted a meta-analysis of 92 studies, mainly American, comparing children of divorced single-parent households with those who lived with both birth parents on measures of well-being. It was found that the children of divorced parents were disadvantaged compared to those from married families. The meta-analysis compared the 'effect size' for each of the included studies. The term 'effect size' is used here as a technical term referring to the statistical measure of a standardised difference between the children in each group which is equally detectable in studies of the same size, and does not imply any causal relationship. These effect sizes reduced over time: the average effect size being greatest in the 1950s and 1960s, decreasing through the 1970s, and 1980s. Amato and Keith conclude that the implications of parental divorce for children's well-being have become less pronounced since the 1950s and 1960s .

This would seem to support the idea that the impact of divorce is reduced as prevalence rises. This is also thought to explain the generally lower effect sizes found in studies in the US compared with those conducted in some other Western countries where divorce rates are lower. In particular, Amato and Keith found that the effect sizes for academic achievement decreased with time, although there were no differences for this measure between the US studies and those from other countries.

The aim of this study is to test the hypothesis that the impact of divorce on the educational achievement of children in Britain had decreased during the period from the 1960s to the1980s as divorce rates were rising. The data used were derived from the three British cohort studies which followed children born in a given week in each of the following years: 1946 (the MRC National Survey of Health and Development, NSHD); 1958 (the National Child Development Study, NCDS) and 1970 (BCS70). These children reached the minimum school leaving age[1] in 1961, 1974 and 1986 respectively. These cohorts provide large numbers of subjects (in excess of 4,000, even after attrition due to loss to follow up), and would give reliable estimates compared to the majority of those reported by Amato and Keith.

Social changes during the post-war period
During the time span of the development of the children from each of the cohorts the social climate had changed substantially. Aspects of this

change include: rising unemployment, shifts in employment from manu-facturing and agricultural industries to the service sector, increasing employment of women, particularly those with children, the trend for women to start their families at a later age, the rise in the proportion of births outside of marriage, the expansion of education including further and pre-school levels, housing improvements and rising living standards (Wadsworth, 1986b). At the same time Britain experienced a substantial increase in the rate of divorce and separation. Divorce figures for England and Wales began to show an accelerated rise from the early 1960s until the early 1970s, after which they became more stable (Haskey, 1986). The post-war period has also seen the expansion of secondary education initiated by the 1944 Education Act which provided free places in all state secondary schools, to the minimum age of 15 in 1947 and to 16 in 1972. At the same time there was a growth in the opportunities for tertiary education, in fact the higher the educational level the faster the growth rate and the greater the opportunities for girls (Halsey *et al.*, 1980). The changes in the examination system are particularly relevant to the level of educational attainment. In 1951 the GCE examination replaced the School Certificate and in 1965 the CSE examination was introduced bringing the opportunity of examination success to a much broader ability range.

These changes in social climate were associated with changes in social attitudes and the expectations which influenced the life-course of the children studied. During the period in which the children from the three cohorts grew up there was an increasing social acceptance of divorce and a reduction in the stigmatisation of children with parents who had sepa-rated (Philips, 1988). At the same time expectations of educational attainment increased across generations (Wadsworth, 1986a). These changes in attitude were reflected in policy changes. The Divorce Reform Act of 1969 introduced divorce on grounds of separation (Davis and Murch, 1988). The 1944 Education Act embodied the canon that 'the nature of a child's education should be determined by his (*sic*) capacity and promise and not by the financial circumstances of his (*sic*) parents' (Halsey *et al.*, 1980). The introduction of comprehensive education after the Labour Party came into office in 1964 aimed to promote equality of opportunity across social classes (Halsey *et al.*, 1980).

Problems of comparison

The problem for historical studies such as this is that the attempt to assess change is confounded by the problem of comparability of the measures which are themselves changing in social significance. Estimating the

association of parental divorce with particular outcomes in children at different historical times is a way of measuring change in the social significance of divorce. The reduced effect hypothesis holds that this association decreases with time and explains this in terms of changes in social attitudes. The problem in testing this hypothesis is that the social significance of the outcome measures is also likely to be subject to historical change.

The basis of the reduced effect hypothesis is the assumption that the impact of parental divorce on children is tempered by the fact that they share this experience with many of their contemporaries. In other words, the social impact of a factor is determined, at least in part, by its relative frequency in the population. A similar argument can be applied to the outcome measure itself. For example, if we consider the educational attainment of children, not getting any school qualifications had an entirely different meaning for children born in 1946, when about half[2] of all children left school without any formal qualifications, than for children born in 1970 when only a small minority of children were in this situation. The difficulty in finding external criteria for defining equivalent educational qualifications in a changing social climate can be resolved by defining the outcome normatively or relative to the rest of the population. In other words, we can define equivalent educational attainment levels at different time points in terms of a constant percentile point on the distribution of educational qualifications.

Measurement of 'effect'
A further issue in testing the reduced effect hypothesis is how 'effect' is to be measured. The evidence for the hypothesis is based on the meta-analysis of Amato and Keith (1991) which uses the statistic 'effect size'. This is a dimensionless standardised measure which quantifies the detectability of the difference found between study populations. The effect size for a difference in proportions used by Amato and Keith and others is based on the *additive* difference, the difference in *absolute* prevalences of the outcome in the exposed and in the non-exposed. In the current context it is based on the (additive) difference in prevalence of failure to achieve a given level of educational attainment in children from 'intact' families and in those who have experienced parental divorce. For example, if 20 per cent of children who have experienced parental divorce fail to gain school qualifications compared to 10 per cent of children living with both birth parents, the 'effect size' based on the additive difference of 10 per cent is 0.28, and is equal to the effect size where these proportions are 90 per cent of children from divorced families and 80 per cent of children

from intact families. However, in these two cases the 'effect' of parental divorce would hardly be considered to be comparable. A more intuitively appealing measure of 'effect' in this context is based on the *ratio* of proportions or *relative* risk. In the first example the relative risk of gaining no qualifications for children from divorced families compared with those from intact families is 2.0 (20/10), whereas in the second case it is 1.1 (90/80). If the social impact of a factor is a function of its relative frequency in the population, so the effect of the factor on an outcome measure is a function of the prevalence of the outcome amongst those with the factor relative to the prevalence amongst those without the factor. In other words, a correlate of the argument for the reduced effect size hypothesis is that effect is more appropriately measured by the relative risk than by the additive difference or effect size.

The relative risk decreases with decreasing prevalence of the outcome measure. The 'effect size' for the same additive difference in prevalence decreases for outcomes close to the median of the distribution because the differences at the extremes (low and high prevalences) are easier to detect than those in the middle range. However, since small additive differences at low prevalence equate to high relative risks and at high prevalence to low relative risks, the effect size associated with the same relative risk increases with the prevalence of the outcome to middle values then decreases with increasing prevalence.

Whilst these two measures behave differently in relation to the prevalence of the outcome, both are sensitive to it. Hence the influence of the increasing prevalence of divorce on changes in these measures over time is confounded by the influence of the changes in the prevalence of the outcome being assessed. Therefore, in order to assess the influence of the increasing prevalence of divorce we need to control for the prevalence of the outcome measure. In other words we can only test the reduced effect hypothesis in a changing social climate relative to a normative or constant prevalence outcome.

The need for the present study

A number of studies from a range of countries have shown an association between parental divorce and children's lower educational attainment (Amato and Keith, 1991; Rodgers, 1996; Dronkers, 1995; Jonsson and Gahler, 1997). For Britain in particular this association has been shown to apply to the 1946 cohort (Wadsworth and Maclean, 1986; Wadsworth *et al.*, 1990) and the 1958 cohort (Elliott and Richards, 1991; Kiernan, 1992). However, there has as yet been no direct comparison of the associations found in the two studies. In this study we derived comparable data

on educational qualifications and family background from the two earlier cohorts and analysed data from the BCS70 'Youthscan' (16-year-old sweep) obtained from the ESRC Data Archive in order to empirically test the reduced effect hypothesis in relation to educational attainment.

METHODS AND DATA

The MRC National Survey of Health and Development (NSHD)
The study population comprises all legitimate, single births to wives of non-manual and agricultural workers, and one in four single legitimate births to wives of manual and agricultural workers that occurred during the week 3–9 March 1946 in England, Wales or Scotland, a total of 5,362 children (Wadsworth, 1991). In this analysis weighting is used to compensate for the effect of the differential sampling of the manual social class births. The cohort was studied at birth and at intervals of not more than two years throughout childhood and adolescence, including 15 years of age (n = 4,274) and at approximately five-year intervals in adult life, including 26 years of age (n = 3,750).

The National Child Development Study (NCDS)
This study population comprises all births in Britain during the week 3-9 March 1958. A total of 17,414 mothers, representing 98 per cent of all births, were interviewed and the children were subsequently followed up at ages 7, 11, 16 (n = 14,761; or 85 per cent of the birth cohort), 23 and 33 years.

The British Cohort Study, 1970 (BCS70)
This study began with all births in the UK during the week 5–11 April 1970. A total of 17,198 mothers, representing between 96 per cent and 98 per cent of all births, were interviewed and the children were subsequently followed up at ages 5, 10, 16 years (called the BCS70 'Youthscan') (n = 11,615), 21 years (a 10 per cent sub-sample: n = 1,650) and 26 years (n = approx. 9,000). The latter two studies have not yet been deposited at the ESRC Data Archive and so are not yet available for analysis. For this reason the 'Youthscan' data was used as the source for information about educational attainment as well as of family structure. This survey of the cohort members at 16 years of age consisted of some eighteen separate survey documents which were separately administered. Although the overall response rate was high (89 per cent of those traced) this represents the response to any one of the documents. Since the same respondents did not provide information for all the questionnaires which make up the study attrition is greater for any individual document and

increases considerably when variables from different documents are combined for analysis.

Family structure
The children were classified according to their family structure using information from the cohort surveys at 15 (NSHD) or 16 (NCDS and BCS70). They were divided into three groups according to whether they lived with both birth parents ('intact'), had experienced parental divorce or separation ('divorced'), or had experienced parental death at this age (very small numbers had experienced both divorce and death and these were included in the 'divorce' group for this analysis). Separation and divorce are not distinguished and we use the term 'divorce' in the inclusive sense. Those who had been adopted (other than by an 'adoptive' step-parent), were living in care or with other family members or had left home were excluded from the analysis. The NSHD excluded illegitimate births altogether from the original sample. In the NCDS and BCS70 the classification is based on the relationship of the parental figures in the household when the child was 16 years of age. Thus children born to single mothers are not distinguished from those born to married parents and only parents who specifically gave the reason for the absent parent as 'illegitimate' (NCDS) or 'lone parent from birth' (BCS70) are excluded from the analysis. The classification of family structure for the BCS70 cohort is based on analysis of the 'Youthscan' survey document O which was an interview with parents by a health visitor (n = 9584).

Educational qualifications
Study members of the NSHD were asked about their educational qualifications by an interviewer at 26 years of age (n = 3,750). The level of the highest educational and training attainment was classified hierarchically using the Burnham Scale.[3] This scale ranged from doctorate degree or equivalents to no qualifications.

The NCDS study asked the members about their qualifications at age 23 (n = 12,537). These qualifications were similarly classified into a hierarchical scale using the General Household Survey (GHS) Codeframe which specifies a range of equivalent qualifications taking into account different examination types and changes in grading over the years. The scale ranged from higher degree to no qualifications including Certificate of Secondary Education (CSE) ungraded.

The BCS70 'Youthscan' study asked about examination results in the family follow up form (Document T: n = 7,336). This was administered after the time that the children would have received the results of their

examinations taken in their final year of compulsory schooling, in late 1986 to early 1987, by a home visit from a health visitor or by post for completion by parents. Parents were asked whether the children had taken General Certificate of Education (GCE) 'O' levels or Scottish Certificate of Education (SCE) Ordinary or CSE examinations in any particular subjects and if so what grade they had obtained.

No qualifications The BCS70 study members were classified as having no qualifications if they either took no subjects at GCE or CSE level or failed all those subjects taken.[4] Since the earlier cohorts used information obtained from the members when they were young adults, for these cohorts the category 'no qualifications' excluded vocational courses and apprenticeships, clerical or commercial qualifications and City and Guild, which would have been obtained after leaving school.

Less than five 'O' levels Members of the NSHD were classified as having less than five 'O' levels if their highest level of attainment was at 'O' level or equivalent (Burnham C) and they had less than five subjects at this level. In the NCDS this category was equivalent to below level 8 on the GHS Codeframe.[5] Members of the BCS70 cohort were classified as having an 'O' level equivalent if they had passed GCE 'O' level or SCE Ordinary at grade A–C or CSE grade 1, since these are defined as equivalent to the former 'pass' grade in the method of examination in operation prior to 1975.[6]

Measures of effect
For 'Effect Size' we use Cohen's h (Cohen, 1988) which is the effect size for a difference in proportions based on the arcsine variance stabilising transformation. This measure represents differences in proportion that are equally likely to be detected in studies of the same size. It is applied to the difference between the proportions of children from divorced families and intact families with a given level of educational attainment. The relative risk of the outcome for children who experience parental divorce is defined as the ratio of the proportion of children with the outcome from divorced families to the proportion of children with the outcome in intact families. Confidence intervals for the population value of the relative risk were computed using a logarithmic transformation (Katz *et al.*, 1978). The population attributable risk is the prevalence by which the outcome would fall in the total population if the likelihood of poor outcome in the children who were exposed to parental divorce were reduced to the level observed in the children from intact families.

TABLE 1. *Prevalence(per cent) of parental divorce, death and educational attainment in the three British Cohort Studies*

	Year of birth cohort		
	1946	1958	1970
Family structure			
age of child (years)	15	16	16
year of study	1961	1974	1986
divorce (%)	6.2	6.6	17.5
death (%)	7.1	5.6	3.7
Educational attainment			
age at assess. quals (years)	26	23	16
year of assessment	1972	1981	1986/7
No qualifications			
number of cases	4,080	9,034	5,499
prevalence (%)	47.3	26.0	10.0
Less than 5 'O' levels			
number of cases	4,255	9,034	5,725
prevalence (%)	83.0	49.2	64.6
Number of cases	5,362	17,414	17,198

RESULTS

Validation of the prevalences of divorce and educational attainment

Table 1 shows that by the time they had reached their final year of compulsory schooling, the experience of parental separation of the children in these cohorts had increased from 6.2 per cent for those born in 1946 to 6.6 per cent for those born in 1958 to 17.5 per cent for those born in 1970. These results are consistent with those derived in five year bands of birth cohorts from the 1991 National Survey of Sexual Attitudes and Lifestyles (NSSAL) based on a representative sample of the British population (Lewis and Kiernan, 1996, table 6). The results from the NSSAL confirmed that the increase in the number of divorces in Britain since the 1960s has resulted in increasing numbers of children whose parents' marriage had broken down. For those born since the mid-1950s divorce has replaced death as the main cause of family disruption.

The table also illustrates the increasing level of educational qualifications obtained by children born in the later cohorts. Of those born in 1946 47 per cent had no formal qualifications by the time they were 26 years of age compared with 23 per cent of those born in 1958 (at 23 years of age), and of those born in 1970 only 10 per cent had no qualifications at 16 years of age. These figures do not reflect fully the gradient of increasing educational attainment since the figures for the first two

cohorts are based on information collected in young adulthood when some of the cohort members would have had the opportunity to gain further vocational or academic qualifications. The low level of failure to gain examination passes in the 1970 cohort, despite the fact that this information was based on qualifications gained by the end of the last year of compulsory schooling only, is a reflection of the introduction of the CSE examination aimed at the lower ability range.

This expansion in educational opportunity is also seen at the higher level of attainment of five 'O' levels (or equivalents). Between the 1946 and the 1958 birth cohorts the proportion of young adults failing to obtain this level of educational attainment fell from 83 per cent to 49 per cent. The proportion of 64.6 per cent for the 1970 cohort seems to contradict this trend but this can be explained by the fact that the data used related to the children's results at the age of 16 only. Further the difference between the results at 16 and in young adulthood are exaggerated at this level compared to the 'no qualification' level because, as Kiernan has shown for those in the NCDS, 'it is the young people who already had qualifications who were the most likely to improve their position' (Kiernan, 1997).

The examination results obtained for the NSHD 1946 cohort were validated by reference to the examination boards. In view of the high attrition from differential response in the BCS70 'Youthscan' it was particularly important to validate the results presented here for educational attainment levels. Since it was not feasible to refer to all the examination boards for pass rates at the time, it was necessary to use the standard statistics published by the Department of Education and Science (DES).[7] Unfortunately, these provide data on school leavers only and level of qualification of children aged 16 in 1986 had to be estimated by combining statistics for school leavers during the academic years 1985-6 (for those who left school at age 16) and 1986–7 (for those who left school at age 17) and 1987-8 (for those who left school at age 18). In order to use these figures we had to make assumptions about the children who left school at age 17 or 18. A minimum estimate of 72 per cent of children who at age 16 had less than five 'O' levels was derived by assuming that all those that left school after this age with at least five 'O' levels had already obtained this qualification level at 16 years of age. Similarly, the minimum estimate of the proportion of children who had no qualifications at 16 derived from the DES statistics on school leavers was 9.5 per cent assuming that those who left school at 17 or 18 with qualifications had some qualifications at 16. Compared with these estimates of 72 per cent and 9.5 per cent the corresponding BCS70 results are 65 per cent and 10 per cent. Although the BCS70 examination results are based on

TABLE 2. *Differences in educational attainment levels for children who had experienced parental divorce compared to those from intact families*

	Year of birth cohort		
	1946	1958	1970
No qualifications			
prevalence – all	47.3	26.0	10.0
prevalence – intact	45.5	26.6	8.7
prevalence – divorced	62.5	41.0	17.6
difference in prevalence	16.9	16.3	8.9
effect size	0.34	0.35	0.27
relative risk	1.4	1.7	2.0
95% CI for relative risk	(1.2,1.5)	(1.5,1.9)	(1.7,2.4)
population attributable risk	2.18	3.76	12.15
Less than 5 'O' levels:			
prevalence – all	83.0	49.2	64.6
prevalence – intact	82.1	47.7	62.0
prevalence – divorced	91.1	65.4	79.9
difference in prevalence	8.9	17.7	18.0
effect size	0.27	0.36	0.40
relative risk	1.1	1.4	1.3
95% CI for relative risk	(1.05,1.2)	(1.3,1.5)	(1.2,1.3)
population attributable risk	0.67	2.14	3.86
Median educational attainment:			
prevalence – all	56.1	49.2	52.1
prevalence – intact	54.1	47.7	49.2
prevalence – divorced	71.6	65.4	68.1
difference in prevalence	17.6	17.7	18.9
effect size	0.37	0.36	0.39
relative risk	1.3	1.4	1.4
95% CI for relative risk	(1.2,1.5)	(1.3,1.5)	(1.3,1.5)
population attributable risk	1.91	2.14	5.05

only 63 per cent of all respondents to the 'Youthscan' survey, the results obtained are not inconsistent with those derived from the DES statistics, considering the assumptions made.[8]

Measuring 'effect'
Table 2 gives the resulting measures of effect associated with divorce. The 'effect size' (ES) itself gives contradictory evidence in relation to the reduced effect hypothesis depending on the level of educational attainment considered. Whilst the estimated 'effect size' of parental divorce on getting no qualifications decreases in the 1970 cohort with the increase in divorce rate, it apparently increases over the time period for the higher level of qualification. This can be explained by the increase in ES with the absolute difference between the proportions of the outcome amongst the divorced (exposed) and the intact (non-exposed). Thus, despite the arcsin

transformation, the ES is low where the prevalence of the outcome is either very low (as for no qualifications in the 1970 cohort) or very high (as for less than 5 'O' levels in the 1946 cohort).

The relative risk (RR), however, provides evidence against the reduced effect hypothesis. The results in Table 2 show that it increases over the time periods of the cohort for both the low and higher levels of educational attainment, with the one exception of the difference between the 1970 and 1958 cohorts for the higher level of educational outcome. The pattern is accounted for by the increase in the relative risk with decreasing prevalence of the outcome illustrated in Figure 1. However, the confidence intervals for the relative risks show that this increase is not, in general, statistically significant since the intervals overlap for the same outcome level across the time periods. Larger, and statistically significant differences (at the 5 per cent level) are found between the different levels of educational attainment in the same cohort than between different time points. It is therefore only by holding the prevalence of outcome constant that the impact of the increasing level of divorce can be assessed independently of the influence of the outcome prevalence.

The median level of educational attainment was derived from the distributions of each of the scales used in the three cohorts (Burnham for the 1946 cohort; GHS Codeframe for the 1958 cohort and the number of 'O' level equivalents for the 1970 cohort). In the NSHD by age 26 approximately half of the sample had qualifications below 'O' level or its equivalent, in the NCDS this median level of educational attainment was five 'O' levels by age 23 and in BCS70 three 'O' level equivalents at the age of 16. These levels represent the educational attainment of half of the population of the cohort members. Using the median level of educational attainment as the outcome measure we observe constant effects over time in terms of relative risk or 'effect size' (Table 2). The relative risks (with 95 per cent confidence intervals) of lower than median educational attainment associated with parental divorce are 1.3 (1.2 to 1.5) for the 1946 cohort and 1.4 (1.3 to 1.5) for the 1958 and 1970 cohorts. Thus children born in post-war Britain whose parents separated are about 1.4 times more likely than those whose parents remain together to achieve a lower level of educational attainment than half of their contemporaries. These results are shown graphically in Figure 2.

In terms of the social capital of the nation the importance of exposure to parental divorce on educational attainment may be more appropriately measured by the population attributable risk. This measures the reduction in prevalence of low educational attainment in the total population if the likelihood of the poorer outcome amongst those children who experi-
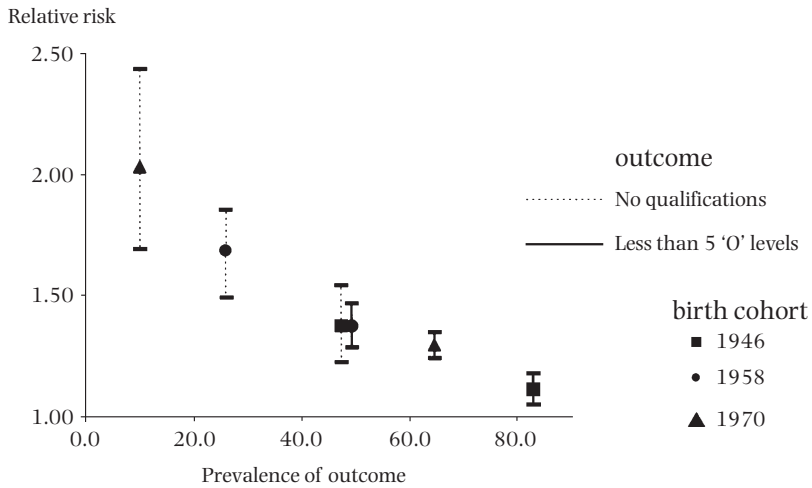
Figure 1. Relative risk (with 95% confidence interval) associated with parental divorce of different levels of educational attainment by prevalence of outcome
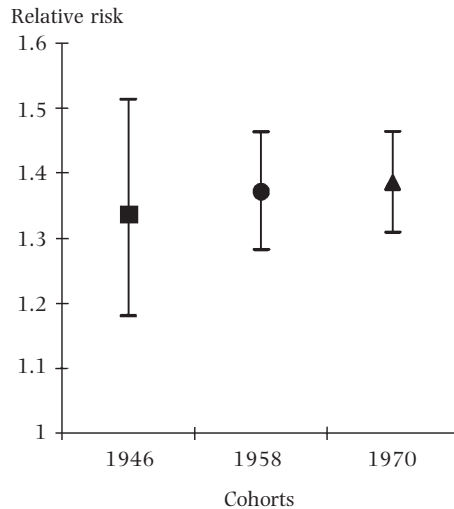

Figure 2. Relative risk (with 95% confidence interval) associated with parental divorce of lower than median educational attainment

enced parental separation were reduced to the level observed in intact families. The estimated population attributable risk is more than doubled in the 1970 cohort (5.0) compared to the 1946 cohort (1.9) with the considerable increase in the prevalence of the experience of parental divorce by these children.

DISCUSSION

This inter-cohort analysis has shown that the overall association of parental separation and children's educational achievement has not attenuated during the quarter of a century after the second world war in Britain. This refutes the commonly held opinion that the effects of divorce on children have attenuated with the increasing prevalence of divorce (the reduced effect hypothesis). The relative risk of lower than median educational attainment associated with parental divorce was remarkably constant across the three cohorts at 1.3 to 1.4, with 95 per cent confidence intervals of 1.2–1.3 to 1.5 . The risk is quite small compared to the effect of other factors on education such as socioeconomic status, but is one which is statistically significant based on the large cohort studies used here. Although the estimated relative risk is small, its social importance has increased as the proportion of children affected by this type of family change has increased in line with the increase in the divorce rate.

Methodological points

Two methodological points are made in this paper. First, the relative risk based on the relative proportion is a more appropriate measure than the 'effect size' based on the absolute difference which is generally used in the literature. Second, both of these measures are dependent on the prevalence of the outcome measure. A historical comparison should therefore control for changing prevalence of outcomes. This was achieved here by defining outcome in terms of percentile point, in this case using the median.

There are inherent difficulties in making historical comparisons in a changing social climate. The problem of comparability of measures across three studies is compounded by the changes in social significance of these measures. It is therefore, on reflection, no surprise that in our initial analysis the measures of 'effect' resulted in apparently ambiguous evidence in relation to the reduced effect hypothesis. This apparent ambiguity is a result of the sensitivity of the measures of effect to the prevalence of the outcome used and the change in prevalence of the outcome is a reflection of its changing social significance. The problem is to define a level of educational attainment which would be in some sense equivalent or have the same social significance for children who were completing their compulsory schooling in 1961 or in 1974 or in 1986. The solution presented here is to define the outcome relative to the social norm at the time of each study, that is by an internal rather than an external criterion – using a constant percentage point on the distribution of the education scale within each study rather than, say, obtaining five 'O' level examina-

tion passes. Using the median level of educational attainment, the prevalence of the outcome measure is constant over time enabling us to estimate the effect of the change in prevalence of divorce.

Potential bias in the results

There are two potential sources of bias in the results presented here, but taking into account evidence from other studies leads us to the conclusion that the direction in which this bias operates adds weight to our conclusion against the reduced effect hypothesis.

First, the assessment of educational qualifications was taken from interviews at ages 16 in the 1970 cohort but at ages 26 and 23 in the 1946 and 1958 cohorts, respectively. Would the later acquisition of academic or professional qualifications in early adulthood bias the comparison of the earlier cohorts with those from the BCS70? Evidence from earlier cohorts suggests that children whose parents had divorced were less likely to improve their qualifications in early adulthood than those from intact families (Kiernan, 1997)[9]. This evidence implies that had the results at the minimum school leaving age been used, as they were for BCS70, then the negative association between divorce and educational attainment would have been smaller in the earlier cohorts and the results would have added weight to our conclusion that the reduction effect does not hold.

The second potential source of bias is attrition, in particular the high attrition from differential response in the BCS70 'Youthscan' Study. Differential attrition in relation to family structure is a problem which is generally encountered in all longitudinal population surveys. In the NCDS, those whose parents had divorced by age 16 were significantly less likely to be in the sample at age 23 (Elliott and Richards, 1991). Similarly, attrition is significantly greater at ages 18 and 21 compared with 15 for children from divorced families compared with those from intact families in the MRC West of Scotland Twenty-07 Study (Ely *et al.*, forthcoming). In BCS70 there were negative biases in response at the 'Youthscan' compared to the birth and 10 year data for those children whose father's social class is defined as 'non-supported' (Goodman and Butler). In addition, parents who had separated were less likely than those who remained together to have completed the questionnaire containing educational qualifications. A likely explanation for this differential attrition is that divorced families are more likely to have moved or face disruption and other adverse circumstances. If these characteristics are also associated with poor educational attainment in children, as seems likely, our estimates based on the responders would underestimate the negative

association between divorce and educational attainment. The effect of the greater attrition in BCS70 would in that case be to add weight to the evidence against the reduced effect hypothesis.

Implications

We have shown that the overall association between parental divorce and educational attainment has not attenuated during the post-war years in Britain. However, the analysis conducted was limited to a simple bivariate association in order to compare overall effects and it does not imply any direct causal relationship. It is beyond the scope of this analysis to examine the pathways through which parental separation may be associated with the educational achievement of children. We can, however, draw on current research to find plausible explanations for our unexpected result.

First, although the association between parental divorce and the educational achievement of children has not changed in magnitude, it is evident that the attitudes of our society towards divorce have changed during the time in which the children of the three cohorts grew up. Those children born immediately after the war whose parents divorced certainly suffered a stigma which would be unlikely in more recent years. The extent of the belief that life with only one parent constituted a poor prognosis for the future of the child concerned was evident from data collected in the 1946 birth cohort study. In this study nurses rated home circumstances of all families, and it was clear that whatever the social class of the family, those who had experienced parental divorce or separation received significantly lower ratings; however, families where, it later turned out, the parents were to divorce in the next five years, were not differentiated by these ratings, and nor were families already broken by death (Wadsworth, 1979). With the rising divorce rate experienced by later cohorts, attitudes became more liberal and, as propounded by the reduced effect hypothesis, this can only have mitigated the effect of the experience for children. If this is the case, the constant relationship found here can only be explained by the effects of other social changes acting in the opposite direction.

Research has shown that many different processes may account for the relationship between parental separation and the well-being of children (Richards and Ely, 1997). One important mediating factor for educational outcome is family income. Divorce is associated with a decline in family income and low family income is strongly associated with poorer educational attainment in children. In each of the three cohorts it has been found that low income or financial hardship in the family substantially attenuates the difference between children from divorced families

and those from intact families (Wadsworth and Maclean, 1986; Kiernan, 1997; Ely *et al.*, forthcoming). In the latter study of the children born in 1970, family income alone accounted for the lower educational attainment of children living in lone parent households, who otherwise did no worse than their contemporaries living in intact families.

Thus the apparently constant effect of parental divorce on educational attainment could be the observed result of two factors acting in opposite directions: changes in social attitudes acting in a positive direction and an increase in the relative economic hardship experienced by separating families having a negative impact on their children. Evidence for increasing relative deprivation is evident in the work of Bradshaw who, reporting on work for the ESRC Children 5–16 initiative, states: 'There is now very clear evidence that children have suffered most from the sharp increase in poverty and inequality that have been experienced in Britain over the last 20 years or so' (Bradshaw, 1998). This period relates in particular to children of the 1970 cohort in which we see the most dramatic rise in parental divorce rates.

If this interpretation of the results is accepted, given the current trend of increasing economic disparity, the implications for the present day are a further increase in the population risk of a widening gap in educational achievement. Since the mid-1980s the number of lone parent families has increased. In 1995/6 20 per cent of dependent children lived in lone parent families, one and a half times the proportion in 1986 (ONS 'Social Focus on Families', 1997). At the same time, the UK has the highest poverty rate of children living in lone parent families where the youngest child is of school age compared to other countries (including Europe, Eastern Europe, Taiwan and Russia), in the Luxembourg Income Survey circa 1990 (Bradshaw, 1998). Whilst policies to promote employment for lone mothers are to be welcomed, in the face of rising unemployment, the policy action of the New Labour government to cut the level of Income Support for lone parent families can only exacerbate the situation. Educational attainment is an important marker not only for social mobility but also for good health in later life (Kuh and Wadsworth, 1993) and the effects of adverse circumstances during childhood are not limited to one generation (Wadsworth and Kuh, 1993). It is time to invest in the future health of the nation by reducing socioeconomic disparity.

NOTES

1 The minimum school leaving age was 15 in 1961 (raised by the 1947 Act) and was raised to 16 in 1972 (Education Statistics for the UK, Government Statistical Service, HMSO).
2 Of the 1946 cohort members, 47 per cent had no qualifications by the age of 26 when 'qualifications' included vocational courses (see Table 2 in the results section).

3   Department of Education and Science. *Burnham Further Education Committee Grading Courses 1972.* HMSO, London, 1972.
4   'O' level grades were A to E and fail. CSE level grades were 1 to 5 and fail. Thus a qualification was a subject passed at 'O' level grade A to E or CSE grade 1 to 5.
5   GHQ Codeframe level 8 was five or more subjects at GCE 'O' level obtained before 1975 or in grades A-C if obtained later; five or more subjects at SCE Ordinary obtained before 1973, or in bands A-C if obtained later; five or more subjects at CSE grade 1, or at School Certificate/SLC lower/SUPE Lower; City and Guilds Craft or ordinary, or in Standard Grades 1-3.
6   Education Statistics for the United Kingdom, 1986 edition. Goverment Statistical Service, HMSO.
7   Statistics of Education: School Leavers GCSE, CSE and GCE, 1988 (DES).
8   The estimates derived from the DES statistics of school leavers are themselves subject to sampling error. Besides being based on a 10 per cent sample of all school leavers in England only, they also include estimates for the small independent schools not included in the survey and for the small number of schools which failed to respond.
9   The proportion of children from divorced families who had less than 5 'O' levels at 15 but who had obtained 'A' level or a higher qualification by the age of 26 was 9.9 per cent (27/273). The corresponding proportion for those who had not experienced parental divorce was 15.5 per cent (434/2,796), giving a difference of 5.6 per cent with 95 per cent CI of 1.8 to 9.4.

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