Secular change in psychosocial risks: the case of teenage motherhood

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ABSTRACT

Background. Many social and demographic correlates of psychiatric disorder have shown marked secular changes in recent decades. This study was designed to explore some of the implications of these trends, focusing on the illustrative case of teenage motherhood.

Method. Prospective data from two British birth cohort studies (the 1946 and 1958 cohorts) were used to examine the social, educational and behavioural precursors of teenage *versus* older age at motherhood, and the implications of teenage motherhood for women's later marital and social circumstances and risks of psychiatric morbidity, in samples born 12 years apart.

Results. Educational and social disadvantage were associated with similarly increased risks of teenage motherhood in both cohorts, but the findings suggested an additional association with teacher-rated adolescent conduct problems in the more recent sample. Rates of teacher-rated emotional problems were not elevated among teenage mothers in either cohort. In adult life, teenage motherhood was associated with a range of adverse social outcomes, including partnership breakdowns, large family size, and poorer housing conditions. Relative risks of these adult adversities were similar for teenage mothers in the two cohorts, but absolute levels of adversity were higher in the more recent sample, reflecting general secular changes in many of the indicators involved. In the later, but not the earlier, cohort, teenage motherhood was also associated with increased risks for psychiatric morbidity in adulthood.

Conclusions. The findings underline the importance of taking account of secular trends in examining the impact of psychosocial risks.

INTRODUCTION

Recent decades have seen marked secular changes in many of the social and demographic correlates of psychiatric disorder. Changing patterns of family formation provide some of the most striking examples here: since the 1970s, the nuclear family of the post-war era has given way to a diversification of family forms, the postponement of marriage and parenthood, and sharp increases in rates of divorce and remarriage in most Western societies (Hess, 1995).

The impact of these changes on rates of psychosocial disorders is attracting an increasing amount of attention (see e.g. Rutter & Smith, 1995).

In this paper we focus on secular change in one particular aspect of family formation – early entry to motherhood, in the teens – and examine its implications for women's mental health. Teenage motherhood is known to be associated with a range of adverse social consequences (Furstenberg *et al.* 1989) and with negative health outcomes for both mother and child (Fraser *et al.* 1995). From a psychiatric perspective, a number of studies have demonstrated links between early parenthood and adolescent behaviour problems (e.g. Yamaguchi
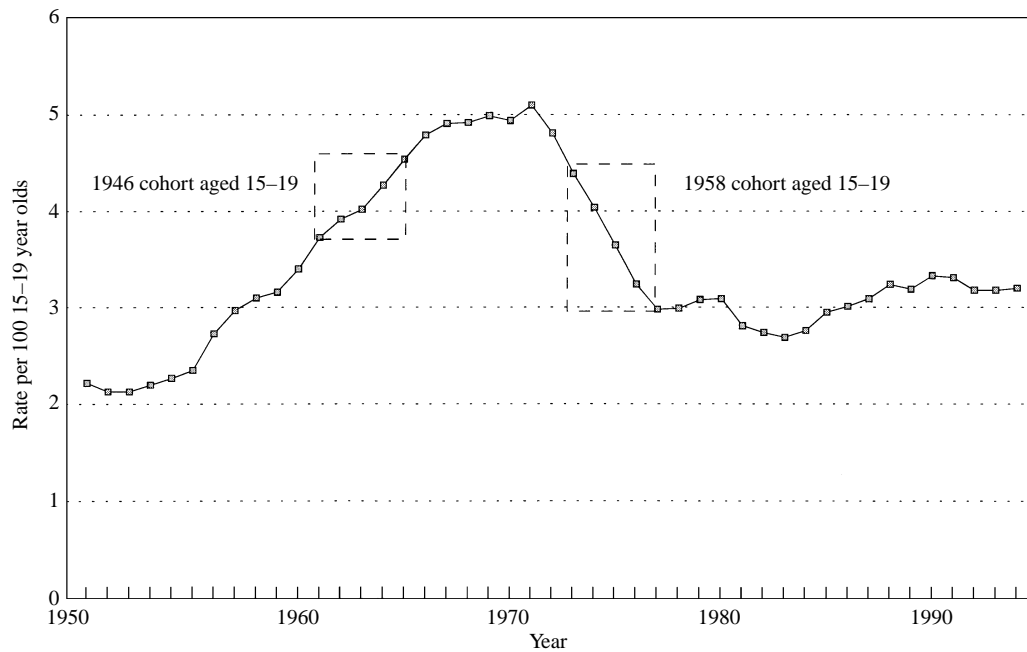
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Fig. 1.   Rates of live births to teenage mothers in England and Wales, 1950–94.

& Kandel, 1987; Abrahamse *et al.* 1988; Elster *et al.* 1990; Ensminger, 1990; Horowitz *et al.* 1991; Kovacs *et al.* 1994; Bardone *et al.* 1996), and premarital pregnancy and early childbearing have been examined as being among key mediators of links between childhood adversity and vulnerability to psychiatric disorder in adult life (Harris *et al.* 1990; Quinton *et al.* 1993).

Yet, recognition of teenage motherhood as a serious social problem seems a relatively recent development. In the US context, Furstenberg *et al.* (1989) noted that until the 1960s teenage parenthood received '…little public notice and much less opprobrium' (p. 313). A recent British study concluded that though rates of teenage childbearing have declined dramatically since the 1960s, early parenthood appears, paradoxically, to be intensifying as a social problem (Kiernan, 1995). Our interest here is with the impact of these changes for women's mental health.

As a background to the discussion, Fig. 1 shows rates of births to teenage mothers in England and Wales since 1950. Teenage fertility rates were low – at around 2% – in the years preceding, during, and immediately after the Second World War. As Fig. 1 shows, levels rose

steadily during the 1950s, more than doubling by the early 1960s and reaching a peak at just over 5% in 1971. Between 1972 and 1976 rates fell quite sharply, then levelled out at around 3% (Macfarlane & Mugford, 1984). The increasing availability of contraception, along with changes in abortion law, undoubtedly contributed to the 1970s decline. In addition, the fall in rates took place against the background of more widespread changes in ages at marriage and entry to parenthood (Kiernan & Eldridge, 1987). Up to the 1960s, marriage occurred increasingly early; for young people born in the 1940s, average ages at marriage were the youngest since civil registration began, with around half of all women in these cohorts marrying between the ages of 20 and 22. This advance of marriage had important consequences for patterns of age-specific fertility, with women in the 1950s and 1960s having their babies earlier in life than had previously been usual (Coleman, 1988). Since the 1970s, however, both of these patterns have been reversed: average age at marriage has increased, and there has been a continuing trend towards the postponement of parenthood (Kiernan, 1995).

As this brief overview suggests, the social

contexts for teenage motherhood varied markedly between the 1960s and 1980s. We explore some of the implications of these changes here, using data from two of the British birth cohort studies that span key phases of this period. The first, the National Survey of Health and Development, has traced the progress of children born in 1946, while the second, the National Child Development Study, began 12 years later, in 1958. Fig. 1 shows the years in which girls in each cohort reached their late teens. As it demonstrates, girls born in 1946 were teenagers at a time when rates of teenage motherhood were still increasing, and when, as noted above, the average age at which most women had their first child was relatively low. Women in the second cohort, by contrast, reached their teens when levels of teenage motherhood were falling steeply, and when most women were choosing to delay entry to parenthood.

We set out to explore implications of these trends in three different domains: first, for the characteristics of girls most at risk of teenage parenthood in the two cohorts; second, for the social consequences of teenage motherhood for later life circumstances; and third, for women's risks of psychiatric morbidity in adult life. In the first of these areas – precursors of teenage motherhood – existing studies suggest that many of the individual and family correlates of early entry into parenthood have shown considerable stability over time. It has generally been noted that individuals' likelihood of teenage motherhood is '…greatly influenced by their background, including possibilities they have to gain access to further and higher education' (Macfarlane & Mugford, 1984, p. 105). Kiernan (1980, 1995) has provided detailed accounts of the background characteristics of teenage mothers in the two cohorts studied here. Poor financial or socio-economic circumstances in childhood, a variety of indicators of low or declining educational performance and inter-generational continuities in early marriage or parenthood all emerged as key predictors of teenage motherhood in both cohorts. In the more recent cohort, Kiernan (1995) also examined a composite indicator of emotional well-being in childhood and adolescence. High scores on this index (combining both disruptive and emotional problems) were much more common among teenage than post-teen parents,

and remained significant predictors of teenage parenthood in multivariate analyses taking account of socio-economic and educational factors. These findings echo results from a number of other investigations, which have demonstrated relatively consistent associations between early pregnancy/parenthood and disruptive behaviours (see e.g. Kovacs *et al.* 1994; Bardone *et al.* 1996), but more equivocal findings on links with affective problems (Yamaguchi & Kandel, 1987; Bardone *et al.* 1996). Our first aim was to examine the relative impact of these differing precursors to teenage motherhood in the two national survey cohorts.

Turning to adult circumstances, the adverse social sequelae of early parenthood have also been extensively documented. In the US context, teenage pregnancy and childbearing have been associated with a host of negative consequences for young mothers' later educational, economic and marital careers (see Furstenberg *et al.* 1989, for an overview). Kiernan (1980, 1995) has documented many of these same themes in the British studies. Teenage mothers were more likely to experience marital breakdowns than those who began child-bearing later, had larger families, and faced poorer economic and housing circumstances in their early adult lives. In the 1946 cohort, subsequent life-course contingencies varied in some important ways according to women's marital status at the time of the birth: in general, teenage mothers who had both conceived and given birth to their babies premaritally came from the least favoured childhood backgrounds and faced the most severe adult disadvantage (Kiernan, 1980). In subsequent cohorts rates of extra-marital births increased sharply and the social meaning of illegitimacy began to change. Marital and partnership status groupings were less clearly differentiated in terms of childhood precursors within the 1958 cohort, but teenage mothers as a group still experienced marked difficulties in their adult lives (Kiernan, 1995).

In part, these difficulties may have been exacerbated by secular changes affecting other aspects of women's later life-course over this period. The divorce rate has increased steadily since the 1960s, a trend which has been especially noticeable among couples who married young. As a result, the proportions of young women who have had to deal with the consequences of

a marital breakdown, and face motherhood without the financial and social support of a husband, have increased markedly. Women who have their first child early in life are also known to be likely to achieve a larger than average family size, and this pattern has been maintained as overall fertility rates have fallen (Hess, 1995). Changes in labour market conditions constitute yet another area of importance. While female employment in general has become more common (Halsey, 1988), this is less likely to have extended options for teenage mothers, who often lack relevant qualifications, and are unlikely to be candidates for jobs that would pay wages that could cover child care costs.

These adverse social consequences of teenage parenthood are of concern in their own right. In addition, many are known to constitute risk or vulnerability factors for psychiatric morbidity in adulthood. Divorce has been consistently associated with elevated rates of psychiatric problems (Aseltine & Kessler, 1993), and lack of an intimate supportive relationship with a partner, and the presence of many young children in the home, have emerged as key vulnerability factors for the onset of depression (Brown & Harris, 1978; Harris *et al.* 1990). Employment has been suggested to have some positive effects, though findings here have been more controversial (e.g. Bromberger & Matthews, 1994; Rajala *et al.* 1994). Equally important, a number of the childhood precursors of teenage motherhood also carry well-established risk for adult mental health. In particular, both emotional and conduct problems in childhood show links with later depression and other affective disorders (Robins & Price, 1991; Zoccolillo, 1992; Harrington, 1994).

From a developmental perspective, then, teenage motherhood is associated with two differing sets of risks for psychiatric problems. Young mothers are more likely to suffer childhood disadvantages that put them at risk for adult emotional malfunctioning, and also to be exposed to adult life circumstances that, in their turn, elevate risks of later psychological problems. As we have seen, many of these latter factors have also been the subject of considerable secular change. To date, we know little about the ways in which the childhood characteristics of teenage mothers, their adult life circumstances and their later psychological health may have

transformed as a consequence. To address these issues, we posed three related questions in the present study. First, have secular trends in the context for teenage motherhood been associated with changes in the childhood precursors of early parenthood, and in particular in the salience of adolescent behavioural or emotional problems over time? Secondly, have there been changes in the later consequences of teenage motherhood, in terms of women's adult life circumstances? And thirdly, what are the implications of these two sets of factors, and of teenage motherhood *per se*, for adult mental health in these two cohorts, born just 12 years apart? In each case we hypothesized that as rates of teenage motherhood began to decline, so its links with behavioural and psychiatric problems might become more marked.

METHOD

Samples

The analyses were based on data from the National Survey of Health and Development (NSHD) and the National Child Development Study (NCDS). The NSHD is a prospective longitudinal survey of 5362 men and women born in England, Scotland and Wales during the week 3–9 March 1946, originally designed as a maternity survey. All legitimate, single births to mothers from non-manual and agricultural backgrounds, and one-quarter of children born to mothers from working-class backgrounds, were selected for inclusion in the study. Data were collected at regular intervals, at least every 2 years during childhood and less frequently during adulthood (Wadsworth, 1991). The most recent data collection was at age 43–44 years. For comparability with adult information from the later-born cohort, the data presented here were obtained either before or at the follow-up in 1982–3, when subjects were aged 36; as outlined below, all analyses were weighted to take account of the stratified sampling design.

NCDS is a prospective study of all children in Britain born in the week 3–9 March 1958 – some 17000 in all. The study began as a perinatal mortality survey (Butler & Bonham, 1963) and has since involved a series of follow-ups, at ages 7 years (Davie *et al.* 1972), 11 years (Wedge, 1969), 16 years (Fogelman, 1976), 23 years, and

most recently at age 33 (Ferri, 1993). To ensure comparability with the 1946 study population, the small groups of multiple births (2·4 % of the cohort) and illegitimately born children (4·0 % of the cohort) were excluded from the analyses throughout.

Measures

The measures were selected to tap conceptually similar constructs, measured so far as possible at similar ages, within each study. All measures were treated as dichotomies, with cut-points selected to achieve maximum comparability between the two data-sets. Details of the specific cut-points used for each measure are given below; to take account of the stratified sample design in the 1946 cohort, all cut-offs defining particular proportions of the sample were determined using data weighted back to the original population proportions.

Childhood background
Family social class
Registrar General's classifications of family social class in childhood were available from each of the childhood study sweeps. Data from the age 4 contact in the 1946 cohort, and the age 7 contact in the 1958 study, were used in the present analyses and treated as a simple dichotomy contrasting children from non-manual backgrounds with all remaining cohort members.

Childhood ability
Cohort members' academic abilities were assessed throughout childhood in each study. For the present analyses, we have used scores from general ability tests administered at age 15 in the 1946 survey and age 11 in NCDS. In the earlier survey, cohort members completed the AH4, a well-established 130-item verbal and non-verbal test (Heim, 1967), of good test–retest reliability (Douglas *et al.* 1968). In the more recent study, cohort members completed a comparable test, specially designed by the National Foundation for Educational Research, including 80 alternate verbal and non-verbal items. This showed high reliability (0·94, Kuder–Richardson Formula 20) and was reported to provide a measure of performance very similar to that achieved on typical IQ tests (Adams *et al.* 1976). In each sample, scores in the bottom quartile of the test score range were taken to index low childhood abilities.

School leaving qualifications
Details of formal school-leaving qualifications were collected from schools and local education authorities. The public examination system changed in the period between the two studies. Formal academic school leaving qualifications were restricted to 'O' and 'A' levels – designed for the most able segment of the school population – for members of the earlier cohort, while the Certificate of Secondary Education, designed to be appropriate for wider ability ranges, was available as an additional examination for 1958 cohort members. To ensure comparability between the measures used here, subjects with 'O' level pass grades (or accepted equivalents) were contrasted with all those without qualifications at this level.

Adolescent emotional and behavioural problems
In the 1946 survey, collection of adolescent emotional and behavioural problems preceded the development of the behaviour checklists commonly used today. At age 15, however, teachers were asked to rate behaviours that closely matched those included in the Rutter B(2) scale (Rutter, 1967) used with the later sample. The 1946 survey scales included indicators such as truancy, aggressive and antisocial behaviours on the one hand, and anxious behaviour, shyness and withdrawal on the other. Factor analyses produced two major scales, of behavioural and emotional problems respectively. In the 1958 cohort, the Rutter B(2) scale was completed by teachers at the age 16 contact. This is a 26-item questionnaire tapping both disruptive and emotional problems. It has been widely used in epidemiological studies, and shows high test–retest reliability (Elander & Rutter, 1996). Factor analyses of the 16-year data were used to generate the antisocial and emotional subscales used in the present analyses. The antisocial scale included items tapping interpersonal aggression, disruptiveness and truancy, while the emotional scale loaded on items reflecting sadness, anxiety and social isolation from peers. In both studies, high emotional and conduct scores were operationalized as scores at or above the 90th percentile of the distributions on each subscale.

Teenage motherhood

Data on cohort members' fertility histories were collected at all adult sweeps in both samples, and were used to determine whether, and at what age, women in each study had had a child. Women were classified as teenage mothers if they reported one or more live births before age 20. Those who reported miscarriages or abortions in their teens were not included in the teenage mother group unless they also reported a live birth before age 20; in the same way, the small group of women who had children in their teens who were subsequently given up for adoption, or placed in other substitute care arrangements, were nonetheless treated as teenage mothers.

Adult outcomes

Family size

Women also reported the number of children they had given birth to by the mid-thirties study contacts (age 36 in the earlier cohort and age 33 in the more recent sample). This indicator was used in a binary form, with a cut-off of four children or more used to index large family size.

Current partnership status

In both samples, subjects reported their current partnership status at the mid-thirties study contact. This variable was coded to distinguish between women who were living alone, and women who were in a cohabiting or marital relationship, independent of previous relationships or separations.

Partnership breakdown

The interviews also included details of partnership histories. Women who had experienced one or more separations or divorces were contrasted with those still in their first marriage/cohabiting relationship.[1] A small group of mothers in the 1958 sample ($N = 17$ in the

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[1] Cohabitations and legal marriages were combined throughout the analyses. Non-marital cohabitation was rare at the time most members of the earlier cohort were establishing their first partnerships, and was not separately recorded at the first adult study contact. In the later cohort, non-marital cohabitation was somewhat more common: 7·3% of teenage mothers and 8·0% of older mothers in the samples analysed here cohabited with their first partner. Preliminary analyses confirmed that although cohabitation was associated with a number of adult adversities in the 1958 sample, inclusion of a marriage *v.* cohabitation term in the analyses had no effects on contrasts between teenage and older mothers.

analysed sample) reported that they had never lived with a partner. They were excluded from analyses treating partnership breakdowns as possible outcomes of teenage motherhood, but retained in all other analyses, grouped with those who had not experienced partnership breakdowns.

Multiple partnerships

Women with one partnership, independently of whether this relationship was still intact, were contrasted with those in their second or subsequent relationship, or who had experienced two or more partnership breakdowns. Women who reported that they had never lived with a partner were classified in the one partner only category on this indicator.

Employment status

Information on subjects' employment status was again derived from self-reports in the mid-thirties. Subjects who were not in any kind of paid employment were contrasted with those in either full- or part-time work.

Housing tenure

Subjects also reported the nature of their housing tenure at age 36 or 33. Women living alone or with their partners in owner-occupied accommodation were distinguished from those in all other forms of tenure, including those living with relatives and renting privately or from local authorities.

Psychiatric morbidity

In the earlier cohort the short version of the Present State Examination (Wing *et al.* 1974), containing standardized ratings of symptoms of depression, anxiety and phobias, was administered as an integral part of the interview at age 36. One of the measures derived from this was the total symptom score which, in a population sample, reflects mainly minor affective symptomatology (Rodgers & Mann, 1986). In the 1958 study, subjects completed the Malaise Inventory, a 24-item measure of affective symptoms with good reliability and external validity in general population samples (Rutter *et al.* 1970). Scores on each measure were dichotomized to identify women with high degrees of current psychological distress. Comparisons of

score distributions on the two measures suggested that a cut-point close to the 91st percentile allowed for identification of the most closely similar proportions of high scorers in the two samples. Epidemiological estimates of the prevalence of psychiatric disorder in women vary, but most (see e.g. Bebbington *et al.* 1991; Kessler *et al.* 1993) suggest rates of at least 10%, rising to 15% or above for married women, or those caring for children. Anxiety and depression make up the great majority of these disorders. Although the measures used in the present analyses did not provide direct assessments of disorder, scores above the selected cut-points seem very likely to be indicative of minor affective disorder.

Analyses

Tests for bivariate comparisons were undertaken using chi-squared tests of independence, while the multivariate analyses used logistic regression models. To take account of the stratified sample design used in the 1946 survey, all of the analyses were undertaken in SUDAAN (Shah *et al.* 1992). SUDAAN was designed specifically for the analysis of data from multi-stage samples. It is able to account for complex sample designs when computing variance estimates and test statistics, as well as having facilities that allow the computation of population estimates using weights. Where other packages assume simple random sampling, thereby producing standard errors that require oversimplified assumptions, SUDAAN allows sample design effects to be included in the analysis. Variance estimation for non-linear statistics is based on a well-known approximation for large samples, a first-order Taylor series approximation of the deviations of estimates from their expected values (Kendall & Stuart, 1973). The general approach taken in SUDAAN is first to compute Taylor series linearization for a particular statistic. These linearized values are then used to compute the variance of a total estimate, appropriate for the specified design option.

Response rates and data availability

Both cohort studies have achieved very satisfactory response rates across their various data collection sweeps, ranging from 70% to 90% at each contact. In the 1946 survey, 14·3% of women in the original study population were known to have died or emigrated by age 36; adult outcome assessments were obtained on 75·7% of the remainder. In the 1958 study, age 33 response rates (again excluding known deaths and emigrations) were slightly lower, at 72·0%. As our prime interest was in the precursors and implications of age at motherhood, we restricted the analyses to adult respondents in each study who were known to have had at least one child by the time of the mid-thirties adult contact, and for whom age at the birth of their first child could be determined. In the 1946 cohort, 12·5% of women had not yet had a child, and so were omitted from the analyses. In the later study, the proportions who had not yet had children were higher, at 21·7%.

To ensure consistency in the cases included in each stage of the analyses, we excluded any cases with missing data on any of the variables of interest in the study. As these included a range of measures from the childhood sweeps, in addition to the adult responses, this requirement resulted in an inevitable reduction of cases within each sample: complete data were available for 69·4% of mothers in the 1946 cohort ($N = 1004$) and 59·4% ($N = 2539$) in the 1958 study. In both studies, rates of teenage motherhood were somewhat lower in the complete data cases than in the full sample of mothers (13·8% *v.* 16·5% in the 1946 study, 13·7% *v.* 18·3% in the 1958 study). Previous analyses of attrition within each cohort (Wadsworth *et al.* 1992; Shepherd, 1993) have identified very similar childhood factors associated with subsequent data losses: childhood social disadvantage, low ability and attainment and behavioural deviance have been among the most important predictors of attrition in both studies. We undertook a series of logistic regression analyses to explore effects on data losses here, using a binary indicator of complete data availability as the dependent variable, and cohort and the five measures of childhood characteristics (social class, ability, antisocial and emotional problems and school qualifications) as predictors. As expected, there were significant effects of cohort ($\chi^2 = 22\cdot86$, df $= 1$), reflecting the greater levels of data loss in the more recent study. Low childhood ability and both antisocial and emotional problems in adolescence, were also associated with higher rates of data loss overall. Tests for interactions between the childhood

factors and cohort only revealed one significant effect: women without school-leaving qualifications were significantly more likely to have been lost to the analyses in the 1958 than the 1946 cohort ($\chi^2 = 7\cdot10$, df = 1). In all other respects, the impact of childhood background factors on subsequent data losses appeared to have been similar in the two studies.

RESULTS

Precursors of teenage motherhood

As outlined above, rates of teenage motherhood in the analysed samples were closely similar in the two cohorts: 13·8 % of mothers had their first child in their teens in the earlier cohort and 13·7 % in the more recent sample. Within the teenage mother samples, distributions of specific ages at motherhood were also broadly similar. In both studies, only small proportions of the teenage mothers had had their babies at or before age 16 (8·0 % in the 1946 cohort and 8·4 % in the 1958 study) and rather larger groups (13·9 % and 24·2 % respectively) at age 17; the majority of the teenage mothers (78·1 % and 67·5 % in the two studies) were thus aged 18 or 19 years at the birth of their first child. The cohorts also showed very similar profiles in girls' partnership situations at the time these early pregnancies were conceived, with the majority of conceptions occurring before girls had begun living with a partner (73·9 % in the earlier cohort and 72·9 % in the later group). In the earlier cohort, however, the majority of the young mothers were married by the time their child was born (88·1 %). This pattern was less marked in the later cohort, were 76·1 % of teenage mothers gave birth to their child within a marital/

cohabiting relationship, but almost a quarter were without the support of a residential partner at the time of the birth.

We began by examining childhood precursors of teenage motherhood in the two cohorts. Table 1 gives rates of each of the selected childhood risk factors for teenage and older mothers in each sample. As previous reports have highlighted, teenage motherhood was strongly associated with both social and educational disadvantage. Across the periods covered by both of these studies, young mothers were predominantly drawn from low social class backgrounds, and showed high levels of educational disadvantage: over 40 % fell into the lowest quartile of ability range in childhood and almost 80 % left school without academic qualifications, by contrast with fewer than half of the mothers who began child-bearing later. Teacher-rated emotional problems in adolescence were not elevated among the youngest mothers, but antisocial problems were. In addition, as Table 1 shows, the antisocial ratings were the only indicators to show significant differences between the cohorts ($\chi^2 = 7\cdot25$, df = 1, $P < 0\cdot01$); while rates of other childhood risk factors had remained broadly similar in the two samples, disruptive behaviour problems seemed a comparatively more common correlate of teenage motherhood in the more recent cohort.

To examine these differences in a multivariate framework, we used logistic regression analyses, with age at motherhood (teenage or older) as the dependent variable, and the five childhood risk factors, together with an indicator for cohort, as predictors. We began with a model including each of these factors as main effects, then

Table 1. *Rates of childhood precursors: teenage and older mothers*

	Teenage mothers		Older mothers	
	1946† cohort (N = 338) %	1958 cohort (N = 347) %	1946† cohort (N = 2106) %	1958 cohort (N = 2192) %
Manual social class	88·5	88·2	75·0	73·2
Low childhood ability	40·5	41·2	24·6	22·8
Adolescent antisocial behaviour	14·8	27·4*	9·7	8·8
Adolescent emotional problems	7·7	13·5	10·8	8·3
No school-leaving qualifications	79·3	77·8	49·0	44·6

† Figures for 1946 cohort re-weighted.
* $P < 0\cdot01$.

Table 2. *Predicting teenage motherhood: logistic regression models*

	OR	95% CI	χ^2 to remove (df = 1)	P
Main effects, cohorts combined				
Cohort	0·98	0·73–1·26	0·01	NS
Manual family class	1·75	1·23–2·49	9·43	< 0·001
Low childhood ability	1·34	1·02–1·76	4·11	0·04
Adolescent antisocial behaviour	1·97	1·44–2·70	17·63	< 0·001
Adolescent emotional problems	0·77	0·38–1·18	1·26	NS
No school-leaving qualifications	3·16	2·31–4·32	52·43	< 0·001
Cohort × factor interactions				
Cohort × family class			0·01	NS
Cohort × low ability			0·05	NS
Cohort × antisocial behaviour			4·24	0·04
Cohort × emotional problems			2·52	NS
Cohort × school qualifications			0·00	NS

undertook a series of additional analyses testing the effect of each possible cohort × factor interaction. Table 2 summarizes the results. The upper section shows odds ratios, 95% confidence intervals and significance tests for the main effects model, while the lower portion shows the Wald χ^2 values and associated significance levels achieved by adding each interaction term to the main effects model.

The findings confirmed the pattern suggested in the bivariate analyses. Adolescent emotional problems were unrelated to risks for teenage motherhood, but there were significant effects of low social class in childhood, low academic ability and lack of school-leaving qualifications, and disruptive behaviour problems in adolescence. Once again, the only significant differences between the cohorts emerged on the disruptive behaviour ratings: taking account of other childhood risks, antisocial behaviour in the midteens was a more powerful predictor of teenage motherhood in the more recent cohort than the earlier one. As rates of teenage motherhood declined in the early 1970s, so the girls at risk of early parenthood were increasingly drawn from groups showing problem behaviour, as well as educational and social disadvantage.

Adult consequences of teenage motherhood

We examined possible social sequelae of teenage motherhood in four main domains: (*i*) relationship histories and current status (experiences of breakdowns in marriages or cohabitations, the extent of second or subsequent partnerships, and the proportions of women living alone at the time of the mid-thirties contact); (*ii*) patterns of child-bearing; (*iii*) material circumstances, as indexed by housing tenure; and (*iv*) economic activity.

Table 3 gives rates of these various outcomes in each cohort, and for teenage and older mothers. It highlights two important themes. First, with the exception of employment in the mid-thirties, teenage motherhood had strong effects on each of these outcomes in each cohort. In both samples, teenage mothers were markedly more likely to have experienced disrupted and re-formed cohabiting partnerships; in the more recent cohort, they were also more likely to be living alone at the time of the mid-thirties study contact. Not surprisingly, perhaps, proportionately more women who began child-bearing early had large families. Finally, using housing tenure as one indicator of material circumstances, teenage mothers were considerably less likely than other women to have achieved owner-occupier status by their mid-thirties.

Table 3 also highlights more general secular trends in these various outcomes between the two cohorts. As discussed earlier, many of the indicators examined here had been subject to general patterns of social change over the period covered by the two studies, with increases in rates of divorce and re-marriage, reductions in average family size and some expansion in the proportions of young families owning their homes. The effects of these trends were most clearly exemplified for older mothers. In the relationship domain, for example, women in the more recent cohort were 50% more likely to have experienced the breakdown of a cohabiting partnership by their mid-thirties, and almost

Table 3. *Rates of adult outcomes: teenage and older mothers*

	Teenage mothers		Older mothers	
	1946† cohort (N = 338) %	1958 cohort (N = 347) %	1946† cohort (N = 2106) %	1958 cohort (N = 2192) %
Partnership history and status				
Marital breakdown	40·8	49·0‡	16·3	24·3‡
⩾ 2 partners	23·1	38·0	9·0	17·9
Currently alone	8·0	17·9	6·5	9·0
Family formation				
Large family size	23·7	17·3	4·7	2·7
Housing circumstances				
Owner-occupier	51·2	51·0	76·9	81·0
Employment status				
Currently working	65·7	62·8	59·7	61·9

† Figures for 1946 cohort re-weighted.
‡ Figures for 1958 cohort exclude women who reported never living with a partner.

Table 4. *Predicting adult adversity: logistic regression models of effects of teenage motherhood*

	1946 cohort		1958 cohort	
	OR	95% CI	OR	95% CI
Partnership history and status				
Partnership breakdown	3·42	2·10–5·58	2·65	2·07–3·38‡
⩾ 2 partners	3·13	1·70–5·74	2·67	2·06–3·45
Currently alone	1·09	0·25–2·54	1·65	1·19–2·30
Family formation				
Large family size	5·64	3·01–10·56	6·00	3·99–9·03
Housing circumstances				
Not owner-occupier	2·12	1·32–3·39	2·59	2·01–3·34
Employment status				
Full or part-time work	0·71	0·24–1·20	0·90	0·65–1·15

All analyses controlled for childhood social class, low ability, antisocial and emotional problems in adolescence, and school-leaving qualifications.
‡ Figures for 1958 cohort exclude women who reported never living with a partner.

twice as likely to have been in a second long-term relationship, than women 12 years their senior. These differences are the more striking when we recall that the study contact with women in the 1958 cohort was at age 33, while that with the members of earlier cohort was at age 36. Changes in family formation patterns and housing tenure were less marked, but nonetheless showed significant differences between older mothers in the two cohorts: large families were less usual, and owner-occupation more common, among older mothers in the more recent study. The extent of labour market participation was the only indicator to remain essentially constant for women in the two cohorts.

To assess the relative risks of poor adult outcome for teenage mothers in each cohort, we again used logistic regression analyses. We anticipated (and preliminary tests confirmed), that childhood adversity would also be associated with these adult outcomes. We thus included all of the childhood variables (low social class, low ability, lack of school qualifications, and antisocial and emotional problems) in the analyses, to assess the additional impact of teenage motherhood once effects of these earlier factors had been taken into account. Table 4 shows the results, giving odds ratios and 95% confidence intervals for the effects of teenage motherhood on each outcome in each cohort. With the exception once again of employment status, teenage motherhood continued to show significant effects on all indicators in the more recent cohort, and on all but current residential partnerships in the earlier sample. The odds

Table 5. *Predicting psychiatric morbidity: logistic regression models of the effects of adult adversity*

	1946 cohort		1958 cohort	
	OR	95% CI	OR	95% CI
Partnership history and status				
Partnership breakdown	2·19	1·28–3·77	2·31	1·76–3·04
⩾ 2 partners	2·12	1·10–2·96	1·78	1·32–2·40
Currently alone	2·61	1·21–5·61	2·79	1·99–3·93
Family formation				
Large family size	1·05	0·88–2·87	2·08	1·26–3·44
Housing circumstances				
Not owner-occupier	2·62	1·57–4·38	3·34	2·53–4·40
Employment status				
Full or part-time work	1·16	0·85–1·52	1·54	1·17–2·01

ratios for each outcome were broadly similar in the two cohorts, and formal tests of cohort × teenage motherhood interactions in the combined samples confirmed that none reached statistical significance. Taking account of childhood disadvantage and the major social changes occurring over the period covered by the two studies, the relative risks of adverse social outcomes associated with teenage motherhood appeared to have remained essentially unchanged.

Adult psychiatric morbidity

Finally, we examined the implications of these factors for the women's experience of mental health problems in adult life. Our measures of psychiatric morbidity reflected current symptomatology in the mid-thirties, many years after the teenage mothers in each sample had begun their families. We thus hypothesized that any effects of early parenthood on later mental health status would be largely mediated through the impact of intervening adversities. To test this, we undertook a series of logistic regression analyses within each data-set, assessing the effects of adult psychosocial adversity on psychiatric morbidity. Table 5 shows the results, giving odds ratios and 95% confidence intervals for each of the adult life-course indicators in predicting psychiatric morbidity in the two cohorts. With the exception of family size and employment status in the earlier cohort, all of these adult adversities showed significant links with adult mental health problems.

As we had anticipated, including teenage motherhood in the analyses had no additional impact in the earlier cohort; indeed, although

rates of psychiatric problems were somewhat elevated among teenage mothers (13·0% *v.* 9·0%), teenage motherhood status *per se* did not show significant associations with mental health problems at age 36 in this group ($\chi^2 = 1·45$, df = 1, NS). In the more recent cohort, differences between the age-at-motherhood groups were more marked, with 18·7% of teenage mothers, but only 7·7% of older mothers, showing high rates of psychiatric morbidity in their mid-thirties($\chi^2 = 43·50$, df = 1, $P < 0·001$). These differences were not entirely attributable to the adult adversities discussed thus far. A logistic regression analysis including indicators of family size, partnership breakdown, living alone, owner occupation and employment status as additional predictors of mental health problems continued to show significant effects of teenage motherhood ($\chi^2 = 12·01$, df = 1, $P < 0·001$). The addition of childhood background factors (manual family class, low ability, antisocial and emotional problems in adolescence and lack of school qualifications) further reduced, but did not entirely eliminate, the group differences; in a reduced model including all significant childhood and adult effects, early parenthood was still associated with increased risks of later psychiatric morbidity ($\chi^2 = 7·01$, df = 1, $P < 0·001$).

This suggested that teenage motherhood may have given rise to additional adversities in the 1958 cohort, not tapped by the measures available in parallel forms in the two studies. We examined a number of possible factors here, including periods of lone parenthood, experiences of domestic violence during the breakdown of relationships, and receipt of state

benefits at the study contact at age 33. Taking account of childhood disadvantage, teenage motherhood was associated with increased rates of all of these adult adversities. Excluding the small group of women who had never lived with a partner, teen mothers were at greatly increased risk of having spent periods as lone parents (OR = 3·93, 95% CI = 3·07–5·04). When marriages or cohabitations had broken down, women were asked if the breakdown had involved serious arguments, and if they and their partner had ever come to blows. Although rates of at least some level of domestic violence in this situation were disturbingly high among older mothers (where a third of those who had experienced a relationship breakdown also reported domestic violence), among teenage mothers this figure rose to 56·4%. Taking account of childhood disadvantage, teenage motherhood continued to index significantly increased risks of domestic violence associated with relationship breakdowns (OR = 2·04, 95% CI = 1·41–2·95). Finally, we examined a measure of financial difficulties, in terms of receipt of state benefits (income support for those on very low incomes, unemployment benefit, and supplementary benefit) at the age 33 contact. Over a third of teenage mothers (36·8%) were in households receiving one or more of these benefits, by contrast with 17·0% of mothers who began their families later (OR = 2·07, 95% CI = 1·60–2·67). As we had anticipated, teenage motherhood was associated with a range of more severe adult adversities than those examined in the joint analyses in the more recent cohort. Adding these to the earlier models to predict psychiatric morbidity, group differences were once again reduced but not entirely eliminated ($\chi^2 = 5\cdot58$, df = 1, $P = 0\cdot02$).

DISCUSSION

Longitudinal studies such as the British birth cohort surveys provide important opportunities to examine psychosocial risks within a developmental framework. Comparisons between cohorts offer more unusual opportunities to explore the impact of social and historical change on individual life-course patterns. Assessing the impact of secular change on individual development presents well-documented methodo-

logical problems (Schaie, 1965; Baltes, 1968). The combination of longitudinal and cross-sectional data available in these two studies goes a considerable way towards overcoming these.

Alongside these advantages, our analyses faced a number of limitations that must be borne in mind in considering the findings. Some of these reflected self-imposed constraints, while others were more intrinsic features of our data sources. First, in planning the analyses, we restricted our focus to key measures suggested in the previous literature, that were readily available, and measured in broadly comparable ways, across the two studies. We were fortunate here in being able to draw on Kiernan's (1980, 1995) detailed analyses of both the precursors and consequences of early parenthood in the two study cohorts, which guided our choice of central constructs for use in the analyses. As we have seen, although it proved possible to select largely comparable indicators of these constructs within each data-set, the specific measures used within each study inevitably varied to some extent. In addition, our requirement for comparable measures across the cohorts meant that we focused on a relatively simplified set of variables that were available in both studies, and omitted a number of more detailed measures that had been found to be of importance within one study or the other. In addition, in neither study were we able to include measures of severe childhood adversity, such as experiences of abuse or neglect. These restrictions are of particular importance for our conclusions on precursors to early parenthood, where misspecification of the models could clearly have influenced our findings.

A second set of methodological issues concerned sample attrition within each study. Both the 1946 and 1958 studies have achieved very positive rates of subject retention over extended periods. Despite this, our requirements for complete data on a wide range of measures, drawn from different sweeps and different reporters, inevitably led to reductions in the numbers available for the analyses. While these losses were in themselves undesirable, our main concern was with the possibility of bias arising from differential attrition between the two studies. Tests for general effects on data losses confirmed the pattern identified in previous analyses of these samples: women with lower

measured ability in childhood, and with behavioural deviance and emotional problems in adolescence, were less likely to be retained in the analyses. In line with these trends, teen mothers were also somewhat under-represented in the full data cases. Overall rates of data loss were higher in the more recent sample, but taking this into account, only one of the childhood indicators (lack of school-leaving qualifications) showed differential effects on data loss in the two studies. In all other respects, the impact of childhood and adolescent background factors on subject attrition and other data losses seemed similar. Most importantly for our findings, although antisocial behaviour in adolescence showed expected effects on data losses in both samples ($\chi^2 = 6 \cdot 19$, df $= 1$), these were similar in the two studies (antisocial behaviour × cohort: $\chi^2 = 0 \cdot 01$, df $= 1$). So far as we could ascertain, the findings were unlikely to have been compromised by differential attrition in any serious way.

Turning to the substantive findings, the analyses were designed to examine possible variations in the precursors and consequences of teenage motherhood in two birth cohorts of women, born 12 years apart. As we have seen, absolute rates of teenage motherhood were broadly similar in the two cohorts, but the social contexts for early parenthood and later aspects of women's life-course changed considerably over the intervening period. In both samples, teenage motherhood was statistically uncommon, and, as many other investigations have demonstrated, associated with a range of disadvantages. For women in the earlier cohort, however, relatively young ages at both marriage and entry to parenthood were still normative, and rates of teenage motherhood in Britain as a whole continued to rise as these young women went through their teens. Although teenage mothers departed from the timetable for childbearing followed by the majority of their peers, this departure was less extreme than in the later cohort. There, with the growing availability of both contraception and abortion, very early parenthood became increasingly uncommon and teenage mothers followed a path increasingly more divergent from that of their contemporaries.

Against that background, the findings highlighted many similarities, but also some key differences, between the cohorts. In terms of childhood risks for teenage motherhood, the analyses confirmed the picture emerging from many previous studies: in both cohorts, young women most at risk for early motherhood were disproportionately drawn from lower social class backgrounds, and from groups with poor school achievements and severely restricted educational qualifications. Teacher ratings of adolescent emotional problems – anxiety, withdrawal and sadness – were not related to teenage motherhood in either cohort, but adolescent disruptive behaviours were. Teacher ratings are well-known to provide lower estimates of affective problems than adolescents' own reports (see e.g. Rutter *et al.* 1976); self-reports, or more detailed interview measures, might thus have revealed a somewhat different picture of the links between teenage motherhood and emotional difficulties. In general, however, the pattern of the findings is in agreement with recent clinical reports that conduct disorder, but not depression, is related to teenage pregnancy (Kovacs *et al.* 1994), and with other studies of links between adolescent externalizing behaviours and risks for early pregnancy (Bardone *et al.* 1996). In addition, our analyses suggested that these links with disruptive behaviours had become more salient over time: as rates of teenage motherhood began to fall in the 1970s, so the girls most vulnerable to early parenthood were increasingly likely to show behavioural as well as educational difficulties.

We can only speculate on the factors involved here. One initial possibility is that, rather than being specific to teenage motherhood, the findings reflect a more general increase in the prevalence of antisocial behaviour among girls over the period covered by the two studies. Self-reports of antisocial personality from the US Epidemiological Catchment Area Study (Robins & Regier, 1991) and UK figures on officially recorded offending (Wadsworth, 1979; Smith, 1995) have both shown marked reductions in male:female ratios in recent decades. In England and Wales, for example, the sex ratio in offending fell from around 11:1 males to females in the late 1950s to around 5:1 in the late 1970s (Smith, 1995). If, as seems likely, other indicators of antisocial behaviour followed similar trends, then part of the explanation for the cohort differences noted here may lie in a general

increase in levels of disruptive behaviours among girls in the more recent cohort.

In addition, issues more specific to birth control also seem likely to have played a part. Part of the fall in teenage parenthood since the early seventies was undoubtedly attributable to greater access to information about family planning and contraception. A second important factor was the introduction of the 1967 Abortion Act, which gave women who conceived unwillingly much greater choice over whether to continue with their pregnancies. Although some estimates suggest that overall rates of abortion were broadly similar in the years before and immediately after the Act (Macfarlane & Mugford, 1988), there can be little doubt that this was a highly influential development, potentially increasing self-selection among teenage mothers. Coleman (1988) noted that the most striking increase in the proportion of pregnancies terminated by abortion was among unmarried teenagers, where rates almost doubled between 1971 and 1981. Despite this, more recent data suggest that terminations are by no means evenly distributed across the population (Smith, 1993), and that working-class girls have greater difficulty than those from more affluent backgrounds in negotiating access to the NHS abortions they desire (Simms & Smith, 1986). All of these factors, along with increasing demands within the labour market for qualifications and training for better paid employment, are likely to reinforce the tendency for teenage motherhood to remain largely confined to girls facing multiple disadvantages. This is clearly a development of concern; by the same token, it also provides valuable pointers to the groups most important to target for preventative interventions.

In terms of later consequences of teenage parenthood, our analyses confirmed the picture emerging from many previous studies. Teenage motherhood was related to a variety of adverse adult life-course indicators, including marital breakdown, multiple partnerships, lack of current partner support, large family size, and a reduced likelihood of home ownership. The longitudinal nature of our data was important here in enabling us to assess the impact of early motherhood on these later outcomes taking account of the effects of childhood disadvantage. With the exception of current residential part-

nership status in the earlier cohort, the findings suggested a significant additional impact of early motherhood on adverse outcomes in each of these areas.

Comparisons between the cohorts on these social outcomes highlighted two key findings. First, relative risks of adverse adult outcomes were essentially similar in the two studies, and we found no evidence that the extent to which teenage motherhood raised risks for exposure to these later adversities had changed over the period. Secondly, however, because of general secular change on many of these indicators, the proportions of young mothers exposed to adult difficulties were often considerably higher in the later cohort. As rates of psychosocial risk change, so effects of this kind may also be found in relation to the outcomes of a range of early adversities.

Our prime interest in these social factors was as potential mediators of risk for adult psychiatric morbidity. We assumed that any increased risk for later psychological distress would be more directly attributable to these more proximal adult circumstances, rather than to the experience of early motherhood *per se*. As expected, the great majority of these adverse adult outcomes were indeed related to increased risks of later mental health problems. In both cohorts, having experienced the breakdown of a partnership, having had two or more partners, currently living alone, and living in less favoured housing circumstances were significantly related to high scores on measures of psychiatric morbidity in the mid-thirties. Taking these factors into account, teenage motherhood showed no direct links with adult psychological distress in the earlier cohort, although it continued to show additional effects in the later study. Further exploration of the life situation of teenage mothers in the 1958 cohort suggested that the measures used in the joint analyses did not fully capture extent of the adversities these young mothers had faced. More detailed analyses highlighted their increased risks of past periods of lone parenthood and experiences of domestic violence, and current dependence on benefits. Although we were not able to test this directly, the findings support the possibility that as teenage motherhood became a less common pathway for young women in the later cohort, so its consequences became increasingly severe.

In addition to their specific relevance for teenage motherhood, the results of this study also raise the more general issue of the time-specificity of many findings in psychiatric epidemiology. The time span between the two cohorts studied here was of only 12 years. Even so, we identified some key differences between these two groups of teenage mothers, with important implications for themselves, and almost certainly – although we were not able to explore these here – for their children. As our study suggests, the implications of particular risk factors can change substantially over relatively short periods of time, as a consequence of changing social circumstances and environmental demands. The period covered by our studies was clearly one of rapid social change in a number the demographic factors known to constitute risks for psychiatric disorder. Although rates of change in some of these indicators have slowed in more recent years, others continue to change (Hess, 1995) and it seems unlikely that we are moving towards a generally more stable social environment. As our findings suggest, changes in rates of risk may also imply changes in their social meaning and later outcomes. As we study these associations, we need to remain sensitive to the implications of secular change for our understanding of individual development.

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