

Teen-aged mothers in contemporary Britain

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Background: This paper describes the circumstances of contemporary young mothers and their children from a nationally representative sample, and compares them to the circumstances of mothers who delayed childbearing beyond age 20. **Methods:** The participants are members of the Environmental Risk (E-risk) Longitudinal Twin Study, which follows an epidemiological sample of 1,116 women who became mothers in England and Wales in 1994–95, and their children, and contains an over-sample of young mothers. Home visits were conducted when the children were aged 5 years. Data were collected from mothers via interviews, from children via experimental tasks and observations, and from teachers via postal questionnaires. **Results:** Young mothers encountered more socio-economic deprivation, had significantly less human and social capital, and experienced more mental health difficulties. Their partners were less reliable and supportive, both economically and emotionally, and were more antisocial and abusive. The children of young mothers showed reduced educational attainment, were rated by multiple informants as having more emotional and behavioural problems, were at increased risk of maltreatment or harm, and showed higher rates of illnesses, accidents, and injuries. **Conclusions:** Young mothers today face difficulties known to have long-lasting effects for women and their children. Preventions that target young mothers may reduce harm to the physical health, mental health, and social status of future generations. **Keywords:** Teen-aged mothers, poverty, parenting, abuse, behaviour problems, twins.

The United Kingdom has the highest rate of teen childbearing in western Europe; twice that of Germany, three times that of France, and six times that of the Netherlands (Social Exclusion Unit, 1999). After a steep decline in the 1970s, the teen birth rate has remained stable at about 30 births per 1,000 women since the 1980s (Singh & Darroch, 2000). The consequences of teen childbearing are severe for both mothers and their children. Studies in the UK have found that early motherhood is associated with low educational attainment, long-term benefit receipt, low income, low occupational status, divorce, and large family size (Kiernan, 1995; Maughan & Lindelow, 1997; Social Exclusion Unit, 1999). Children born to teen mothers suffer higher mortality rates, and are more likely to be raised in single-parent families, to live in poverty, to engage in delinquent behaviour, and to become teen parents themselves (Manlove, 1997; Morash & Rucker, 1989; Social Exclusion Unit, 1999). These findings are consistent with studies of teen childbearing con-

ducted in the USA and New Zealand (Coley & Chase-Lansdale, 1998; Jaffee, 2002).

Most of the findings regarding the consequences of teen childbearing in the UK are based on national birth cohorts like the National Health and Development Study (NHDS), initiated in 1946, and the National Child Development Study (NCDS), initiated in 1958. Teen childbearers in these cohorts made the transition to parenthood in the early to mid-sixties (NHDS) and early to mid-seventies (NCDS). However, data on more recent cohorts of young mothers are needed because the context of teen childbearing in the UK has changed dramatically since the 1970s. The costs of teen childbearing are likely to have worsened for two reasons. First, contemporary teen childbearing is more likely to occur outside of marriage and, consequently, young mothers cannot rely on a partner's income for support. Today, nearly 90% of births to teens occur outside of wedlock compared to 40% twenty years ago (Social Exclusion Unit, 1999). Second, State support for families with children has decreased since the early eighties, leaving young, single mothers especially vulnerable to poverty (Ringen, 1997). For example, a young mother who is at least 18 years of age can claim only £85.50 per week (~\$128.25) in Income Support, there is no State-supported childcare system, and there are virtually no structures in place to ensure that under-16s will return to school after a birth or that over-16s will receive additional schooling or job training (Social Exclusion Unit, 1999). These changes in the context of teen childbearing are not unique to the UK and can be generalised to the USA which has an even

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higher teen birth rate and lower levels of federal government support for young, single mothers.

In addition to the aforementioned social changes that have worsened the relative financial position of young mothers, actual teen childbearing is a far more statistically deviant event today than it was in the 1970s. A recent study of a New Zealand birth cohort found that 21% of those who became mothers in the mid-sixties to early seventies were teen parents, but only 10% of their daughters first became parents as teens (Jaffee, Caspi, Moffitt, Belsky, & Silva, 2001). Recent research suggests that the risks formerly associated with teen motherhood (age 19 and under) in times past now affect young mothers who are older than 19, but whose childbearing is off-time-early among contemporary cohorts of women (Jaffee, 2002; McElroy & Moore, 1997). Contemporary women are delaying their first childbirth until their late twenties; the mean age of first birth in Britain is now 28 (Office of National Statistics, 1996). As a result, a woman who begins childbearing at age 20 or even later is disadvantaged today in comparison to her cohort peers (Foster, Jones, & Hoffman, 1998). Disrupted education is one example of how this disadvantage happens. Teen childbearing in the 1960s and 1970s was likely to disrupt secondary education, which was then necessary for the job market. In contrast, contemporary childbearing before age 21 reduces the likelihood of obtaining post-secondary education, which is increasingly necessary for success in the modern labour market. In the study presented here, we defined 'young mothers' as those who first gave birth at or before age 20, because they are as off-time-early for their generation as teen-aged mothers were a generation ago.

The goal of this paper is to describe the circumstances of contemporary young mothers from a nationally representative sample of mothers in England and Wales, and to compare them to women who delayed childbearing beyond age 20. Study women first became parents between the mid-eighties and mid-nineties. This paper describes their socio-economic attainment, relationship histories, mental health, and parenting experiences. Data were also collected on their children's cognitive development, behaviour and health.

Method

The E-risk Study sample

Participants are members of the Environmental Risk (E-risk) Longitudinal Twin Study, which investigates how genetic and environmental factors shape children's development. The study follows an epidemiological sample of families with young twins. The E-risk sampling frame was two consecutive birth cohorts (1994 and 1995) in the Twins' Early Development Study (TEDS), a birth register of twins born in England and Wales (Dale et al., 1998). The full register is administered by the

government's Office of National Statistics (ONS), which invited parents of all twins born in 1994–1995 to enroll in TEDS. Of the 15,906 twin pairs born in these two years, 71% joined the TEDS register. Our sampling frame excluded opposite-sex twin pairs and began with the 73% of TEDS register families who had same-sex twins.

The E-risk Study sought a sample size of 1,100 families to allow for attrition in future years of the longitudinal study while retaining statistical power. An initial list of 1,210 families was drawn from the TEDS register to target for home visits, a 10% over-sample to allow for non-participation. The probability sample was drawn using a high-risk stratification sampling frame. High risk families were those in which the mother had her first birth when she was 20 years of age or younger. We used this sampling 1) to replace high risk families who were selectively lost to the TEDS register via non-response, and 2) to ensure sufficient base rates of problem behaviours given the low base rates expected for 5-year-old children. Early first childbearing was used as the risk-stratification variable because it was present for virtually all families in the register, it is relatively free of measurement error, and it is a known risk factor for children's problem behaviours (Maynard, 1997). The sampling strategy resulted in a final sample in which two-thirds of Study mothers accurately represent all mothers in the general population (aged 15–48) in England and Wales in 1994–95 (as compared to estimates derived from the General Household Survey; Bennett, Jarvis, Rowland, Singleton, & Haselden, 1996). The other one-third of Study mothers (younger only) constitute a 160% over-sample of mothers who were at high risk based on their young age at first birth (15–20 years).

Of the 1,210 families targeted, 7 were discovered to be ineligible for inclusion in our study because the twins had moved overseas, did not speak English, were being reared by neither biological parent, or were opposite-sex. Of the 1,203 eligible families, 4% of families refused, and 3% were lost to tracing or could not be reached after many attempts. The final sample of 1,116 families (response rate = 93% of all mothers, 90% of young mothers, and 95% of older mothers) participated in home-visit assessments when the twins were age 5 years in 1999 and 2000. The sample includes 55% monozygotic (MZ) and 45% dizygotic (DZ) twin pairs. The young mothers had 56% MZ and 44% DZ twins, while older mothers had 51% MZ and 49% DZ twins. Sex is evenly distributed across zygosity (49% male).

Although E-risk is a twin study, it is informative about the topic of this paper – differences between young and older mothers – because both groups of mothers have twins, so multiple birth is held constant in our comparisons.

Procedures

We aimed to collect data within 60 days of the twins' fifth birthday, succeeding for 80% of the families. On average, the children of young mothers were assessed when they were 5.0 years old and the children of older mothers when they were 5.0 years old. With mothers' permission, questionnaires were posted to the chil-

dren's teachers, and teachers returned questionnaires for 94% of cohort children.

Research workers visited each home for 2.5 to 3 hours, in teams of two. While one interviewed the mother, the other tested the twins in sequence in a different part of the house. Families were given Marks & Spencer or Kingfisher vouchers for their participation, and children were given colouring books and stickers. All 16 research workers had university degrees in behavioural science, and experience in psychology, anthropology or nursing. Each research worker completed a formal 15-day training programme on either the mother interview protocol or the child assessment protocol, to attain certification to a rigorous reliability standard. Research workers were blind to mothers' age at first birth. At the time of data collection, young mothers were between 19 and 48 years old, and older mothers were between 26 and 47 years old.

Data from mothers were collected via interviews; no self-completion forms were used. The interview with the mother began with the Life History Calendar (LHC), a visual method that facilitates the accurate recall of life events, their timing and duration. Five-year test-retest reliability for life events on the LHC is 90% or better (Caspi et al., 1996). We used the LHC to gather information about numerous different events in the family's and twins' lives. The LHC is a large grid in which rows refer to different events (e.g., residential changes) and columns denote time units (months) during which particular events may have occurred (e.g., moving residences). Mothers reported about events beginning with the twins' birth date and up to the interview date. Because of minor variations in the number of months covered by each LHC, we control for duration in calculating values for each family (e.g., by reporting the percentage of months on the family's calendar during which specific events occurred). The interviewer used the LHC throughout the remainder of the interview to assist the mother's reporting about different topics (e.g., timing of depression episodes). Mothers' interviews included structured protocols that were guided by a booklet and more qualitative, open-ended sessions that were audiotaped. Questions about each twin were separated by one hour of questions about other topics. Each child's protocol was an engaging 45-minute series of games, tasks and puppet shows aimed to assess executive functions, theory of mind, IQ, and social behaviour.

Measures

Factors influencing research participation. Mothers were administered the Wide Range Achievement Test (WRAT-3; Wilkinson, 1993) to measure their *reading level*. We report the percentage of mothers reading below the grade 7 level (approximately age 12 years), as well as the mothers' mean reading scores. After the interview, home visitors rated the mother's *ability to complete and return a postal questionnaire*, unaided by an interviewer (0 = no problem; 1 = some problem; 2 = big problem). We report the percentage of mothers whose ability to do this was rated a 'big problem'. We report evidence of *residential turnover* from the LHC, defined as 2 or more residence moves since the twins' birth.

Economics in the home. Information was obtained about the *educational attainment* of mothers and their current spouses or partners. We report the percentage of mothers and their spouses/partners who have no educational qualifications as well as the percentage who have attained a university degree. The current (or last) *occupations* of mothers (and their spouses or partners) were coded using the Office of Population Censuses and Surveys (1991) Standard Occupational Classification (SOC). Occupational groups are arranged into six social classes (1 = professional occupations; 2 = managerial and technical occupations; 3N = skilled occupations (non-manual); 3M = skilled occupations (manual); 4 = partly-skilled occupations; 5 = unskilled occupations). Families were assigned the higher of the occupations held by the mother or her spouse/partner. We report the percentage of families in which the highest occupation was 3M or below. *Household income* was established by asking mothers to indicate how much total income the household received from all sources before tax in the previous 12 months. We report the percentage of families with yearly income less than £10,000. In addition, mothers were asked to report the number of different *public benefits* they received in the last year (apart from universal child benefit), from a list including contributory, non-contributory, and sickness benefits. Housing tenure and housing stressors were assessed by asking mothers about their housing circumstances and the quality of their home (Ellaway & MacIntyre, 1998). We report the percentage of families who do not *own their own home* and who report that their *home is crowded*. In addition, we report the percentage of families who neither own nor have *access to a car*, an important index of social exclusion (MacIntyre, Ellaway, Der, Ford, & Hunt, 1998). *Perceived difficulty affording needs* was measured with four items asking mothers how often they found it difficult to meet the costs of food and other necessities; rent, mortgage or contribution for keep; bills; and things like having a night out or presents for the family (Mayer & Jencks, 1989). Each item was answered using a six-point response scale (0 = never; 5 = daily), and the answers were summed to form a scale whose internal consistency reliability (coefficient alpha) was .78. The *employment situation* of mothers (and their resident spouses or partners) was recorded using the LHC. For the mothers, we report the percentage of time (in months), from the children's birth to age 5, that the mother was employed either part- or full-time. For the mothers' spouses or resident partners, we report the percentage of time (in months during which the men were resident from birth to age 5) that these men were out of the labour force and not working.

Economics in the neighbourhood. *Neighbourhood conditions* were assessed using 'A Classification of Residential Neighbourhoods' (ACORN), a geo-demographic discriminator developed by CACI Limited (1997) for use in commercial and policy studies conducted in Great Britain (Budd, 1999). ACORN is built entirely using 1991 Census data at the Enumeration District (ED) level, the smallest area at which Census data are made available by the ONS. Great Britain is composed of some 150,000 EDs, each containing approximately 150 households. After analysis of census data items,

CACI identified 79 different items (e.g., age, educational qualifications, unemployment, single-parent status, housing tenure and dwelling type, and car availability) that were combined to give a comprehensive picture of socio-economic differences between different areas. CACI used hierarchical cluster analysis to group EDs that share similar characteristics into six broad categories. Category 1 neighbourhoods are the most affluent in Britain, and are characterised by high incomes, large single-family houses, and access to many amenities. Category 6 neighbourhoods are the most deprived in Britain, and are dominated by government-subsidised housing estates, low incomes, high unemployment, and single parents. Each family in our sample was matched to the ACORN code for its neighbourhood via its postal code, using the ED-to-postal-code look-up file produced by ONS. In this article, we report the proportion of families living in Category 6 neighbourhoods. In addition, we report the percentage of families living in *council housing*. Perceptions of local-area *neighbourhood problems* were measured by asking mothers about 13 types of socio-environmental problems in the area around where they live (e.g., noisy neighbours, arguments, or loud parties; inadequate public transportation; noisy traffic; dump/sewage smells) (Sooman & MacIntyre, 1995). Each of the 13 items was answered using a three-point response scale (0 = never; 2 = often), and the answers summed to form a scale whose internal consistency was .75. In addition, mothers were asked about whether their *family was victimised by a crime* in the neighbourhood, including a violent crime (e.g., mugging, assault), a burglary or home break-in, or a theft. We report the percentage of families victimised by one or more crimes.

Mother's mental health history. Mothers' *alcohol/drug use problems* were assessed with questions from the Short Michigan Alcoholism Screening Test (SMAST; Selzer, Vinokur, & van Rooijen, 1975), and the Drug Abuse Screening Test (DAST; Skinner, 1983), which is based on a modification of the SMAST in order to assess problems related to drug misuse. Mothers rated each question as not true (0), somewhat or sometimes true (1), or very true or often true (2) about themselves. The internal consistency of the mothers' self-reports about substance use problems was .73. Mothers reported their own histories of *antisocial behaviour* using the Young Adult Self Report (YASR; Achenbach, 1997), modified to obtain lifetime data. We report scores on the externalising syndrome, which is the sum of items on the Delinquent Behavior and Aggressive Behavior scales; the internal consistency of this scale was .87. To capture *symptoms of antisocial personality disorder*, we administered to the women questions from the Diagnostic Interview Schedule (DIS-IV; Robins, Cottler, Bucholz, & Compton, 1995) that assessed the (lifetime) presence of Criterion A symptoms of DSM-IV Antisocial Personality Disorder (American Psychiatric Association, 1994, pp. 649–650): Illegal behaviour, deceitfulness, impulsivity, irritability, reckless disregard for safety of others, irresponsibility, lack of remorse. The internal consistency of items making up this symptom scale was .82. *Maternal depression* was assessed using the Diagnostic Interview Schedule (Robins et al., 1995). We assessed lifetime depression according to DSM-IV

criteria (American Psychiatric Association, 1994). In addition, using the LHC as a memory aid, mothers specified if and when they experienced any episodes of depression since the twins' birth. We report the percentage of mothers who experienced a major depressive episode in the last 5 years. After the interview, home visitors rated the *mother's personality* using the 44-item version of the Big Five Inventory (BFI) which yields reliable and valid reports of five major dimensions of personality: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience (John & Srivastava, 1999). The internal consistencies of the five personality measures ranged from .90 to .95.

Biological father's mental health history. Women were interviewed about the twins' biological fathers' mental health history (because in high-risk research, fathers are often absent or unwilling to take part (Jaffee, Caspi, Moffitt, Taylor, & Dickson, in press). Mother's reports about the biological father's *alcohol/drug use problems* were obtained using the SMAST modified to assess a relative's alcohol abuse (Crews & Sher, 1992). The DAST was modified in the same way. The internal consistency of the mother's reports about the biological fathers' substance use problems was .90. Mothers reported about the biological fathers' histories of *antisocial behaviour* using the Young Adult Behavior Checklist (YABCL; Achenbach, 1997), modified to obtain lifetime data. We report scores on the externalising syndrome; the internal consistency of this scale was .91. To capture *symptoms of antisocial personality disorder*, we asked the women questions from the Diagnostic Interview Schedule (DIS-IV; Robins et al., 1995) that assessed the (lifetime) presence among the twins' biological fathers of Criterion A symptoms of DSM-IV Antisocial Personality Disorder (American Psychiatric Association, 1994). The internal consistency of the items making up this symptom scale was .92. A methodological study of mother–father agreement attests to the reliability of these women's reports about men's problem behaviours; mothers' reports account for more than 75% of the variance in men's self-reports on these scales (Caspi et al., 2002).

Family structure and family relationship. We report about seven features of family structure, including the percentage of Study children born *out of wedlock* and the percentage of mothers who were *currently married* at the time of the home visit. Using the LHC, we also report the percentage of time (in months) from the children's birth to age 5 that *both biological parents were resident* in the home; whether the mother had been a *lone parent* since the twins' birth; and whether a *live-in male partner* (other than the twins' biological father) lived with the mother and her children since the twins' birth. Finally, we report the *number of other children* living in the house and the percentage of families with *step and/or half-siblings*.

We report on five features of parent–child relationships. *Parent–child activities* were assessed by asking the mother whether she and the twins had done any of 12 activities together during the past year (e.g., been to a park; been swimming; been to see a circus). *Interparental inconsistency of discipline* was assessed with three questions about how the mother and her current

partner handled child misbehaviour (e.g., 'We disagree about what to do when the children are naughty') (Vaughn, Block, & Block, 1988). Mothers responded to each question as not true (0), somewhat or sometimes true (1), or very true or often true (2). The internal consistency of this scale was .57.

The assessment of parenting behaviour was based on a child-specific interview conducted with the mother. We first report about the likelihood that the *child had been harmed*. Each Study child's experience of harm was assessed using a semi-structured interview (Dodge, Pettit, & Bates, 1994) that first asked about incidents of misbehaviour in the prior year and the sorts of practices typically used to control or correct the child's misbehaviour (e.g., time-out, withdrawing privileges, smacking). The interview then assessed whether the child may have been abused or harmed by an adult, and ascertained whether any agency had been involved out of concern about maltreatment. We inquired about the child's experiences, not the mother's actions, making clear that the acts could have been done by any adult (giving examples of parent, grandparent, teacher, childminder, etc.), and pointing out that we did not ask the adult's identity. The series of semi-structured probes was administered while pointing to the Life History Calendar to help the mother to focus on the 12-month period prior to the interview, and then the questions were repeated, using the LHC to help the mother to focus on the earlier era, before the child's fourth birthday. We explained to the mother that if harm was reported for the prior year, the Study would be obliged under the law to assist families to get help, but if harm was reported that was not ongoing into the past year, the Study could keep this confidential. Thus, mothers retained the choice of reporting period, and mothers who reported harm during the past year understood in advance that this would prompt a follow-up contact and potential intervention. This protocol was designed to enhance the mothers' comfort with reporting child harm, while making clear our responsibilities under the Children Act. At the end of the interview, the interviewer assessed the likelihood that the child had been harmed, based on the mothers' narrative about how authorities had been involved in investigating/treating child abuse, or how the child had been 'hurt' or 'harmed' by either a family or non-family member. Interviewers rated child harm on a five-point scale (1 = definitely not; 2 = probably not; 3 = suspected, possible; 4 = yes, occurred; 5 = authorities involved). We report the percentage of families rated 3 or above.

Two other global ratings of the mother's child-specific parenting were made by interviewers after the home visit. *Maternal warmth* was rated by interviewers on a five-point scale, ranging from 1 = no warmth to 5 = high warmth. We report the percent of mothers who exhibited 'no' or 'little' warmth toward their children (corresponding to a scale value ≤ 2). *Maternal negativity* was also rated on a five-point scale, ranging from 1 = negative or harsh to 5 = affectionate. We report the percent of mothers who were at least 'occasionally negative or harsh, remote, impersonal' about a child (corresponding to a scale value ≤ 2). Coefficients assessing between-interviewer agreement on the ratings ranged from .70 to .96. Finally, using the LHC, mothers reported any periods where each of the twins was

separated from the mother because they were placed in care, living with the other parent, or living with relatives.

We report about three features of partner relationships. The *quality of the mother's relationship with her current partner* was assessed by asking mothers about the emotional intimacy (e.g., 'We feel very close to each other'), trust (e.g., 'I feel I can trust my partner completely'), and communication (e.g., 'We discuss problems and feel good about the solutions') in the relationship. Following Fincham's (1998) recommendation, we combined answers to these questions into a single, unidimensional index of relationship quality, which has an internal consistency of .89. In addition, mothers were interviewed about quarrelling or physical abuse with any partner since the twins' birth (in the past five years). *Quarrelling* was assessed by inquiring about three verbally aggressive acts (e.g., swearing at partner) and *physical partner abuse* was assessed by inquiring about 12 acts of physical violence (e.g., kicking a partner, threatening a partner with a knife). Mothers were asked about their own behaviour toward a partner, and about any partner's behaviour toward them. The internal consistency reliabilities of the quarrelling and physical abuse scales were .76 and .90, respectively. A methodological study of between-partner agreement shows that one partner's report accounts for more than 75% to 80% of the variance in the other partner's reports on these scales (Moffitt et al., 1997).

We report about six sources of social support for parenting. *Partner support* was measured with four questions about the current partner (e.g., 'We support each other during difficult times', 'He helps me out with the children'). Mothers responded to each question as not true (0), somewhat or sometimes true (1), or very true or often true (2). The internal consistency of this scale was .81. We report the percentage of mothers who reported that the *biological father had less than weekly contact* with the twins. We asked the mothers the degree to which each of four different social relationships (i.e., parents, adult siblings, in-laws, friends) supplied each of three different types of *social support* (financial support, emotional support, and support with taking care of the twins) (e.g., 'If you had financial problems and needed help to make ends meet, could you turn to your [social relationship]'). Mothers responded to each question as no (0), maybe (1), or definitely (2). The internal consistency of this scale was .76. We assessed two aspects of neighbourhood support (Sampson, Raudenbush, & Earls, 1997). *Neighbourhood social cohesion and trust* was assessed by asking mothers how strongly they agreed with five conceptually related items (e.g., 'People around here are willing to help their neighbours', 'People in this neighbourhood can be trusted'). *Neighbourhood informal social control* was also assessed with five questions asking mothers about the extent to which residents of the neighbourhood could be counted on to intervene in a number of different ways (e.g., 'If a group of neighbourhood children were skipping school and hanging around, would your neighbours do something about it?'). These two scales had internal consistencies of .83 and .75, respectively. Finally, we report the percentage of mothers who reported that an official service agency had contacted her out of *concern for the children's health*,

educational needs, or welfare in order to provide services or support.

Children's cognitive development. A short form of the Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI; Wechsler, 1990) was used to assess the cognitive ability of children at age 5 years. Using two subtests (Vocabulary and Block Design), children's IQs were computed following procedures described by Sattler (1992; Table H-7). In addition, we gathered information from teachers about whether each child was receiving or in need of *special educational services*.

Children's health and behaviour. Children's *prosocial behaviour* was measured with 10 items from the Revised Rutter Scale for School-Age Children (Sclare, 1997; Goodman, 1994), including items such as 'tries to be fair in games', and 'considerate of other people's feelings'. Parents and teachers each rated the items as not true (0), somewhat or sometimes true (1), or very true or often true (2). The internal consistencies of the parent and teacher reports were .73 and .92, respectively. Children's *externalising and internalising problems* were assessed with the Achenbach family of instruments: The Child Behavior Checklist (CBCL; Achenbach, 1991a) and the Teacher Report Form (TRF; Achenbach, 1991b), respectively. The externalising syndrome reported in this article is the sum of items in the Delinquent Behavior and Aggressive Behavior scales; the internal consistencies of the parent and teacher reports of externalising problems were .88 and .93, respectively. The internalising syndrome reported in this article is the sum of items in the Withdrawn, Somatic Complaints, and Anxious/Depressed scales; the internal consistencies of the parent and teacher reports of internalising problems were .83 and .86, respectively. Children's *hyperactivity* was measured with 17 items from the Rutter Child Scales (Sclare, 1997) and supplemented with items concerning inattention, impulsivity, and hyperactivity derived from the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) diagnostic criteria for Attention Deficit Disorder (e.g., 'cannot settle to anything for more than a few moments, quickly moves from one thing to another', and 'fidgety or squirmy'). The internal consistencies of the parent and teacher reports were .88 and .94, respectively.

Information about *illnesses and accidents and injuries* experienced by each twin, from birth to age 5, was collected with the aid of the LHC. For each twin separately, the structured interview asked mothers to report about any long-standing illness, disability or infirmity; any illness that involved hospitalisation or being bed-ridden for extended periods of time; any operations; and any accidents or injuries that required medical or surgical attention. Details about each condition were recorded by the interviewer and coded according to the International Statistical Classification of Diseases and Related Health Problems (ICD-10; World Health Organisation, 1993). For the purposes of the present analysis, we grouped the conditions into two categories: Diseases of the senses, respiratory system, digestive system, skin, genito-urinary system,

and infections; versus injuries, poisonings, and accidents.

Data analysis

Group differences were evaluated with *t*-tests (for continuous variables), odds ratios (for dichotomous variables), and frequency rate ratios (for count data; e.g., number of injuries). We calculated the effect sizes of the obtained group differences, using the formula,

$$d = (M_y - M_o) / sd,$$

where M_y is the mean for the sample of young mothers, M_o is the mean for the sample of older mothers, and sd is the standard deviation taken over the whole sample. Operationally defined, $d = .2$ is a small effect size, $d = .5$ is a medium effect size, and $d = .8$ is a large effect size (Cohen, 1992). For dichotomous variables, to obtain effect sizes that would be comparable to the standardised mean difference measures (d), we estimated a standardised mean difference statistic by taking the product of the log odds ratio and $(\sqrt{3})/p$ (Haddock, Rindskopf, & Shadish, 1998).

The analysis of data about the Study children (e.g., measures of child-specific parenting; measures of their health and behaviour) was complicated by the fact that our twin study contained two children from each family, leading to non-independent observations. As such, we analysed data about the Study children using standard regression techniques but with all tests and confidence intervals based on the sandwich variance estimator, a method which is available in the statistical package STATA 6.0 (StataCorp, 1999). Application of this technique allows for the relaxation of the assumption of independence of observations by penalising estimated standard errors and therefore accounting for the dependence in the data due to analysing sets of twins.

Results

A *demographic* comparison (Table 1) confirmed that the sample's 562 young mothers differed in their age at first birth from the 554 older mothers. Whereas the group of young mothers were, on average, 18 years old at the birth of their first child, the group of older mothers were, on average, 28 years old. Important for our comparison, the older mothers' mean age at first birth, 28 years, is a near match to the mean age of first birth for British women giving birth in the same time period, 26–28 years (ONS Birth Statistics 1983–1994, 1996). The group of young mothers (those who gave birth for the first time before or at age 20) were, on average, 30 years old at the time of our home visit, having delivered the Study twins when they were aged 25, on average. Thus, the majority of the women in the young-mothers group were no longer teen-agers when their twins were born. The group of older mothers were, on average, 36 years old at data collection, having delivered their twins at age 31, on average. The two groups of mothers' families appeared similar on other sample

Table 1 Description of the sample and factors related to participation in research

Measure	Family type		Group difference <i>t</i> (<i>df</i>), <i>p</i> /OR(95%CI) ^a	Effect size <i>d</i>
	Young mothers <i>N</i> = 562	Older mothers <i>N</i> = 554		
<i>Demographics</i>				
Mother's age at her first birth (M, SD)	18.5 (1.4)	28.4 (4.3)	52.22 (1114) <.01	3.12
Mother's age at study (M, SD)	30.3 (5.8)	35.6 (4.5)	17.41 (1114) <.01	1.04
Study children's sex is female (%)	51.6	50.4	1.0 (0.8,1.3)	0.02
Non-white ethnicity (%)	10.3	8.8	1.2 (0.8,1.8)	0.09
English main language spoken to twins (%)	97.9	97.3	1.3 (0.6,2.8)	0.13
<i>Factors influencing research participation</i>				
Mother's reading level below grade 7 (%)	12.4	3.7	3.7 (2.2,6.2)	0.73
Researcher rates poor ability to fill in questionnaires (%)	18.2	5.4	3.9 (2.5,5.9)	0.75
2 or more address changes, past 5 years (%)	24.0	14.8	1.8 (1.3,2.5)	0.33
Mother did not respond to postal survey (%)	44.3	17.7	3.7 (2.8,4.9)	0.72

^a Continuous variables were analysed with *t*-tests (and their degrees of freedom) and categorical variables with odds ratios (and their 95% confidence intervals).

demographics (i.e., children's sex, non-white ethnicity, and English spoken at home).

Comparison on *factors influencing research participation* (Table 1) revealed that young mothers more often than older mothers had characteristics that were likely to curtail their response to questionnaire surveys. Effect sizes were medium to large. Relative to older mothers, more young mothers read below seventh grade level, were judged by research workers as unable to respond to postal questionnaires, and changed their addresses frequently. Research-worker ratings of the Study women's personality traits also suggested that the young mothers were

less conscientious than the older mothers (see Table 3). Not surprisingly, fewer young than older mothers had responded to a postal survey conducted before we initiated home visits.

Economics in the home were much more troublesome for young mothers than for older mothers (Table 2). Effect sizes for these comparisons were generally medium to large. Objective indicators (e.g., the breadwinner's occupation, the household's past-year income, receiving public benefits beyond the universal child benefit, home ownership, and car access) indicated that young mothers were poorer than older mothers. The women's subjective

Table 2 Family economic contexts influencing children's development

Measure	Family type		Group difference <i>t</i> (<i>df</i>), <i>p</i> /OR (95%CI) ^a	Effect size <i>d</i>
	Young mothers <i>N</i> = 562	Older mothers <i>N</i> = 554		
<i>Economics in the home</i>				
Breadwinner Manual Occupational SES (%)	56.0	19.3	5.3 (4.0,7.0)	0.92
Yearly income less than £10,000 (%)	31.0	4.9	8.7 (5.6,13.4)	1.19
Number of public benefits beyond child benefit (M, SD)	1.8 (1.6)	0.4 (1.0)	16.63 (1113) <.01	1.00
Does not own home (%)	62.1	13.9	10.1 (7.5,13.6)	1.28
No access to a car (%)	22.2	4.0	6.9 (4.3,11.1)	1.10
Perceived difficulty affording needs (M, SD)	5.4 (4.4)	3.1 (3.4)	9.92 (1112) <.01	0.60
Home crowded (%)	35.4	25.9	1.6 (1.2,2.0)	0.19
Percentage of time from birth to age 5 mother employed (M%, SD)	29.6 (34.8)	43.9 (38.7)	6.49 (1109) <.01	0.39
Percentage of time from birth to age 5 resident partner unemployed (M%, SD)	19.5 (34.4)	6.0 (20.1)	7.82 (1063) ^b <.01	0.48
<i>Economics in the neighbourhood</i>				
Lowest ACORN rating (%)	38.9	11.7	4.8 (3.5,6.5)	0.86
Family in council housing (%)	55.3	9.0	12.4 (8.9,17.4)	1.39
Problems in the neighbourhood (M, SD)	4.9 (4.3)	3.0 (3.0)	8.31 (1111) <.01	0.50
Family victimised by one or more crimes (%)	46.8	33.0	1.8 (1.4,2.3)	0.32

^a Continuous variables were analysed with *t*-tests (and their degrees of freedom) and categorical variables with odds ratios (and their 95% confidence intervals).

^b *df* = 1,063 because some women had not had a partner in the past 5 years.

assessment of their circumstances tended to agree; young mothers said they had more difficulty paying for their family's needs (food, bills, a family night out). About one third of both types of mothers felt that their homes were too crowded (perhaps as a natural consequence of having young twins!). Employment was less common for adults in young mothers' than older mothers' households; young mothers spent less time in the labour force and their resident male partners spent more time unemployed.

Economics in the neighbourhoods of young mothers also indicated their poverty relative to older mothers (Table 2). When Study families' post codes were matched to the ACORN system of classification for UK neighbourhood areas, we found that more young mothers than older mothers were rearing their children in Britain's most deprived neighbourhoods. The percentage of young-mother families in this neighbourhood classification (39%) was approximately double the rate for Britain as a whole (22%; CACI, 1997). This finding using the ACORN classification was consistent with the very large proportion of young mothers whose families lived in council housing (55%). Young mothers also reported a greater variety of problems in their neighbourhoods (e.g., noisy traffic, vandalism) than older mothers, although only slightly more young than older mothers reported that their homes and families had been victimised by crime at their current address (violence, housebreaking, or other thefts). However, because young mothers changed addresses more often than older mothers (see Table 1), they had lived at their current address for less time, suggesting that the rate of victimisation over time may be much higher for young than older mothers.

The mothers' mental health and personalities differed notably (Table 3), with effect sizes ranging from small to large. Young mothers, relative to older

mothers, had more problems with substance abuse (unable to stop, abuse-related health problems), though self-reported problem rates were low for both groups of women. Young mothers also admitted more antisocial acts in their lives. More young mothers (33%) had experienced a major depressive disorder in the five years since the study child was born, relative to older mothers, whose rate of depression (23%) was no higher than the rate reported for the general population of women in this age group (Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993, Table 3). Research workers rated the young mothers as less extroverted, less agreeable, less conscientious, more neurotic, and less open to experience, on average, than the older mothers.

The biological fathers' mental health (Table 3) refers to the biological fathers of the study children (whether he was the mother's current partner [77%] or past partner [23%]). As compared to older mothers, young mothers reported that the biological father had more problems with substance abuse, lifetime histories of more antisocial behaviours, and more symptoms of antisocial personality disorder. These differences constituted medium to large effect sizes.

Family structure was much less stable for the families of young than older mothers (Table 4), yielding medium to large effect sizes for these comparisons based on data from the Life History Calendars. The percentage of older mothers who had the Study children out of wedlock, 17%, is lower than the percentage for British women giving birth in the same time period, 32% (ONS, 1996). In contrast, half of young mothers had the Study children out of wedlock, and half of young mothers were unmarried at the time of the Study home visit. During the five-year period from the Study children's birth until the family took part in our home-visit study, fewer young

Table 3 The mental health of mothers and the study children's biological fathers

Measure	Family type		Group difference <i>t</i> (<i>df</i> , <i>p</i>)/OR(95%CI) ^a	Effect size <i>d</i>
	Young mothers <i>N</i> = 562	Older mothers <i>N</i> = 554		
<i>Mother's mental health history</i>				
Alcohol/drug abuse problems	1.2 (2.6)	0.6 (1.7)	4.16 (1110) <.01	0.25
Antisocial behaviours	10.8 (7.9)	6.9 (5.6)	9.50 (1111) <.01	0.57
Antisocial personality disorder symptoms	0.9 (1.3)	0.4 (0.9)	7.48 (1111) <.01	0.45
Major depressive episode last 5 years (%)	33.9	23.2	1.70 (1.3,2.2)	0.29
<i>Mother's personality</i>				
Extroversion	27.4 (6.5)	29.3 (6.9)	4.72 (1112) <.01	0.28
Agreeableness	32.6 (6.9)	35.2 (6.8)	6.19 (1112) <.01	0.37
Conscientiousness	32.3 (7.3)	37.1 (6.0)	12.02 (1113) <.01	0.72
Neuroticism	21.6 (6.4)	19.9 (6.9)	4.26 (1113) <.01	0.26
Openness to experience	26.2 (8.5)	33.9 (9.0)	14.57 (1106) <.01	0.88
<i>Biological Father's mental health history</i>				
Alcohol/drug abuse problems	4.3 (6.7)	2.0 (9.0)	6.69 (1103) <.01	0.40
Antisocial behaviours	10.9 (10)	5.4 (6.0)	11.14 (1106) <.01	0.67
Antisocial personality disorder symptoms	2.0 (2.3)	0.8 (1.5)	10.27 (1108) <.01	0.62

^a Continuous variables were analysed with *t*-tests (and their degrees of freedom) and categorical variables with odds ratios (and their 95% confidence intervals).

Table 4 Family structure, parent-child relationships, mother-partner relationships, and social support for parenting

Measure	Family type		Group difference <i>t</i> (<i>df</i>), <i>p</i> /OR(95%CI) ^a	Effect size <i>d</i>
	Young mothers <i>N</i> = 562	Older mothers <i>N</i> = 554		
<i>Family Structure</i>				
Twin's born out of wedlock (%)	51.1	17.2	5.0 (3.8,6.6)	0.89
Mother not currently married (%)	49.8	19.2	4.2 (3.2,5.5)	0.79
Both biological parents present from birth to age 5 (%)	55.5	81.4	3.5 (2.7,4.6)	0.69
Single-parent household, from birth to age 5 (%)	6.4	1.8	3.7 (1.8,7.6)	0.63
Live-in male partner (not biological father), from birth to age 5 (%)	11.8	1.8	7.3 (3.7,14.3)	1.09
Number of siblings (M, SD)	1.9 (1.4)	0.9 (1.0)	13.03 (1111) <.01	0.78
Families with step and/or half-sibs (%)	41.6	8.7	7.5 (5.4,10.6)	1.11
<i>Parent-child relationships</i>				
Activities together (M, SD)	7.5 (2.0)	8.9 (1.8)	12.10 (1113) <.01	0.73
Inter-parental inconsistency of discipline (M, SD)	2.0 (1.7)	1.8 (1.5)	2.49 (957) ^b <.02	0.16
Lack of maternal warmth (%)	14.5	9.1	1.7 (1.2,2.4)	0.29
Maternal negativity (%)	13.3	5.9	2.5 (1.6,3.7)	0.50
Child harm (%)	12.3	6.2	2.1 (1.4,3.2)	0.41
Child ever in care/separated from mother (%)	5.0	2.2	2.4 (1.2,4.5)	0.48
<i>Mother's partner relationship</i>				
Quality of current relationship (M, SD)	23.0 (5.3)	23.6 (4.5)	1.80 (958) ^b 0.07	0.12
Quarrelling (M, SD)	6.1 (3.0)	4.7 (3.0)	7.67 (1093) <.01	0.46
Physical partner abuse, last five years (M, SD)	5.3 (7.8)	1.8 (4.2)	9.19 (1093) <.01	0.56
<i>Social support for parenting</i>				
Partner support/help (M, SD) ^c	5.8 (3.1)	6.7 (2.4)	5.07 (1110) <.01	0.30
Biological father contact with twins less than weekly (%)	27.7	10.3	3.3 (2.4,4.6)	0.66
Family, friends support/help (M, SD)	14.9 (6.0)	15.7 (5.2)	2.39 (1113) <.02	0.14
Neighbourhood cohesion (M, SD)	7.0 (3.0)	8.2 (2.3)	7.08 (1107) <.01	0.43
Neighbourhood social control (M, SD)	7.1 (2.9)	7.8 (2.5)	4.64 (1098) <.01	0.28
Official service agency involvement – any twin (%)	16.9	9.2	2.0 (1.4,2.9)	0.38

^a Continuous variables were analysed with *t*-tests (and their degrees of freedom) and categorical variables with odds ratios (and their 95% confidence intervals).

^b *df* = 962 because some homes lacked a father figure; values less than this are due to missing values.

^c Mothers without a partner were given a score = 0.

mothers' than older mothers' families had the stable presence of both biological parents. As a consequence, biological fathers were three times more likely to be absent from young mothers' than from older mothers' homes. In addition, more young than older mothers' families had alternative family structures such as a single-parent household for the entire five years, or a live-in male for some of the time who was not the children's biological father. Young mothers had, on average, two more children at home in addition to our Study twins, and many of these were half-siblings or step-siblings. In contrast, older mothers had on average one other child, and in most of these families all of the children were full siblings.

Parent-child relationships were problematic for the Study's young mothers and their children (Table 4). Effect sizes for these comparisons were medium. Young mothers reported that they had been able to do fewer activities with their children (e.g., visit zoos, go swimming). Relative to older mothers, the young mothers said they and the family father figure disagreed more about discipline and differed more on how they disciplined the children. Research workers noted that young mothers were less warm, and more negative, toward their children during the home visit. In addition, Table 4 shows that more young than

older mothers reported that their children had been harmed or hurt in the past by an adult. Finally, more young than older mothers had been separated from the Study children (i.e., because the children were in-care, living with relatives, or the mother was institutionalised).

The mothers' relationships with partners are also shown in Table 4. Young and older mothers reported equally good quality in their relationships. As the maximum score on this scale was 28, and both groups scored 23, the women were feeling, on the whole, positive about the communication, trust, and affection in their current relationships. Questions about quarrelling (e.g., curse or swear at you, insult you in front of others) and physical abuse (e.g., slap, shake, kick, beat up, choke) were asked about any relationships with men that the women had in the five years since the Study children were born, and these measures revealed that young mothers had experienced more abusive relationships than older mothers. These effect sizes were medium.

Social support for parenting is vital for mothers of young twins, and young mothers got less of this from every source except official agencies. Effect sizes were small to medium. Young mothers reported less child-rearing help from their current partners, partly

because fewer young mothers (81%) than older mothers (92%) had a current partner to call on for help. The children of young mothers less often had contact with their biological father; almost one-third saw him less than weekly. Young mothers reported slightly less help than older mothers from family and friends (childcare, financial help, emotional support). Young mothers also lived in neighbourhoods that were less cohesive (people here are unwilling to help neighbours) and had weaker social control (if children were misbehaving, neighbours would not intervene). In contrast, nearly twice as many young mothers (17%) as older mothers (9%) reported that an official agency had contacted them out of concern for the children's welfare; such contacts were requested, for example, by teachers, neighbours, GPs, childminders, and the mothers themselves – prompted by concern about issues such as lack of parenting skills, or children's injuries, malnutrition, disobedience, violence, or learning difficulties – and made by diverse organisations such as Social Services, NSPCC, Barnardo's, housing associations, or the police.

Measures of cognitive abilities are reported in Table 5. The young mothers' children had a mean IQ score (91) that was 9 points below that of older mothers' children (100), whose mean IQ was the same as the population mean IQ. According to teachers' reports, twice as many children of young mothers had been referred for special educational services compared to older mothers' children. Table 5 also shows that although the mean reading attainment score for older mothers was the same as the mean on the standardisation norms for this test, the young mothers' mean reading attainment was much lower (Wilkinson, 1993). Nearly one-third of the young mothers and their male partners lacked any educational qualification, and only 2% of young mothers and 4% of their partners had attained a university degree, indicating academic attainment far below that of the older mothers and their partners.

The children's health and behaviour are compared in Table 6, where effect sizes range from nil to medium. According to both mothers and teachers, the children of young mothers engaged in prosocial behaviours almost as often as did the children of older mothers. However, relative to children of older mothers, the children of young mothers were described as having more externalising and internalising behaviour problems, and more symptoms of inattention-hyperactivity. We compared the children's internalising and externalising problems to standardised norms. Although these comparisons must rely on US norms, they are instructive. Mothers' CBCL reports were compared to published test norms for children aged 4 to 11 (Achenbach, 1991a). The mean scores of older mothers' children were in the 'normal' range, but the mean scores of young mothers' children were in the 'borderline clinical' range. Teachers' TRF reports were compared to test norms for children aged 4 to 18 (Achenbach, 1991b). The mean scores of young and older mothers' children were in the 'normal' range. A general pattern was that mothers reported more behaviour problems than did teachers using the same instrument, and group differences were wider when mothers, as opposed to teachers, did the ratings, although both sources agreed that children of young mothers had significantly more behavioural and emotional problems.

The two groups of children also differed significantly on their histories of illness, accidents, and injuries, although the effect sizes were small. The children of young mothers experienced major illnesses 1.6 times more often than children of older mothers. A closer examination revealed that group differences were especially striking in relation to respiratory illnesses and conditions and to diseases and infections of the senses. Poisson regression models fitted to the number of injuries showed that the children of young mothers experienced 1.2 times more injuries and accidents that required medical attention than did children of older mothers.

Table 5 Cognitive and educational attainment of the children, their mothers, and their father figure

Measure	Family type		Group difference <i>t</i> (<i>df</i>), <i>p</i> /OR(95%CI) ^a	Effect size <i>d</i>
	Young mothers <i>N</i> = 562	Older mothers <i>N</i> = 554		
<i>Children's cognitive development</i>				
WPPSI IQ (M, SD)	91.3 (13.6)	100.3 (13.9)	12.31 (1112) <.01	0.66
Special educational services (%)	23.4	9.0	3.1 (2.2,4.2)	0.62
<i>Mothers' educational attainment</i>				
WRAT reading score (M, SD)	43.6 (6.3)	48.5 (5.9)	13.18 (1093) <.01	0.80
No educational qualification (%)	29.4	6.9	5.6 (3.9,8.2)	0.95
University degree (%)	2.3	22.7	12.4 (6.9,22.3)	1.39
<i>Current father figure's education</i>				
No educational qualification (%)	38.8	14.6	3.7 (2.7,5.2)	0.73
University degree (%)	3.9	24.7	8.1 (5.1,12.9)	1.15

^a Continuous variables were analysed with *t*-tests (and their degrees of freedom) and categorical variables with odds ratios (and their 95% confidence intervals).

Table 6 Health and behaviour of the study children

Measure	Family type		Group difference		
	Young mothers N= 562	Older mothers N= 554	t(df)	P	Effect size d
<i>Children's behaviour</i>					
Mother-reported pro-social behaviour	16.2 (3.2)	16.4 (3.3)	1.03 (1114)	0.3	0.05
Teacher-reported pro-social behaviour	11.3 (5.0)	11.9 (4.8)	2.39 (1028)	<.02	0.14
Mother-reported CBCL externalising problems	15.1 (9.9)	10.6 (7.7)	9.81 (1115)	<.01	0.50
Teacher-reported CBCL externalising problems	6.4 (8.9)	4.4 (7.0)	4.50 (1052)	<.01	0.25
Mother-reported CBCL internalising problems	10.2 (7.6)	7.6 (6.2)	7.37 (1115)	<.01	0.37
Teacher-reported CBCL internalising problems	6.4 (6.2)	5.7 (5.5)	2.27 (1050)	<.03	0.12
Mother-reported inattention-hyperactivity	12.2 (8.1)	9.7 (7.1)	6.98 (1115)	<.01	0.34
Teacher-reported inattention-hyperactivity	6.3 (7.2)	4.5 (6.2)	4.64 (1052)	<.01	0.26
<i>Children's health</i>					
Illness	53.4	41.0	OR (C.I.)1.6 (1.3,2.0)		0.28
Number of accidents/injuries	0.6 (1.0)	0.5 (0.8)	FRR ^a (C.I.)1.2 (1.0,1.4)		0.09

^a FRR = Frequency rate ratio.

Discussion

The goal of this paper was to ascertain whether the adversities associated with early childbearing in the 1960s and '70s still influence young mothers and their families in today's context. More teen births today occur outside wedlock, and the economic climate in which young mothers raise families has changed, as have the labour market implications of discontinued education (Nickel & Bell, 1995). Our study showed that young mothers in present-day Britain continue to have difficulties similar to the difficulties reported for earlier cohorts (Maughan & Lindelow, 1997; Kiernan, 1995; Manlove, 1997). Mothers who gave birth at or before age 20 in the late 1980s and early 1990s have encountered more socio-economic deprivation, have significantly less human and social capital, and experience more mental health problems than mothers who gave birth in their twenties or thereafter. We found that young-mother families tend to remain solo-parent families, as half of the young mothers were unmarried when the twins were born, were unmarried 5 years later, and/or did not have the biological father in the home. Moreover, the partners of young mothers were less reliable and supportive, both economically and emotionally, and were more abusive. The differences between young and older mothers tended to be moderate to large, as indicated by statistical effect sizes. To put these effect sizes in perspective, the differences we observed between young vs. older mothers are in many instances similar to the mean population difference between men and women in body weight.

Similarly, we found that the children of young mothers have more emotional and behavioural problems, higher rates of illnesses, accidents, and

injuries, and their cognitive skills lag behind the children of older mothers. The differences between the children of young vs. older mothers were small to moderate, as indicated by statistical effect sizes. To put these effect sizes in perspective, the differences we observed between children of young vs. older mothers are similar to the differences in aggression that are typically found between males and females (Moffitt, Caspi, Rutter, & Silva, 2001).

The long reach of adversity

In most cases, the women in the young-mothers group were no longer teen-aged by the time their twins were born (mean maternal age of young mothers was 25 years at the twins' birth). By the time of our data collection, 12 years had passed, on average, since the young mothers in our sample had their first birth as an under-21 mother. This implies that, for many women, the difficulties and disadvantages associated with early motherhood are long-lasting. Such persisting difficulties could arise from two different processes. Firstly, it is possible that the individual characteristics of a young woman that contribute to her early pregnancy (e.g., an impetuous lack of plan-fulness) continue to influence the quality of her family life thereafter. Secondly, it is likely that apart from any individual characteristics of a mother, becoming a parent at an early age sets in motion a cascade of subsequent adverse events (e.g., truncated schooling) which prevents her from bettering her family's situation. We found young mothers faring worse than older mothers on both personal characteristics (e.g., personality) and life events (e.g., educational qualifications). Research suggests that for many families both processes operate in tandem (Maynard, 1997; Jaffee et al., 2001).

Our findings about the children of young mothers suggest that young motherhood will continue to affect the health and social status of modern Britain in the future. The 5-year-old children of young mothers were disadvantaged by four childhood problems which longitudinal research has shown to be strong predictors of poor outcomes when children reach adulthood: poor infant health (Wadsworth, 1999), abusive harm (Widom, 1989), low IQ (Lubinski, 2000), and problem behaviours (Farrington, 1995). The findings of this and other studies suggest that difficulties indexed by early motherhood have a long reach, and will continue to reverberate into the next generation (Fergusson & Woodward, 1999; Furstenberg, Levine, & Brooks-Gunn, 1990; Jaffee et al., 2001).

Positive prognoses

To ensure a balanced view, we draw attention to the several measures on which young mothers' families were similar to older mothers' families. Young mothers who had a partner tended to find satisfaction in the relationship, and young mothers reported only slightly less support from their partners, friends and families. Most encouraging, the children of young and older mothers engaged in similar good levels of prosocial behaviours, according to both teachers and mothers. Research has shown that maternal social support and children's prosocial behaviours can be powerful protective factors that prevent childhood behavioural problems from persisting into adolescence and adulthood (Nagin & Tremblay, 2001; Vitaro, Gagnon & Tremblay, 1990). In addition, despite the marked disadvantages of the young mothers as a group, our study revealed much heterogeneity within the group. In fact, although more young than older mothers had difficulties, it was also true that on most Study measures there were more young mothers without difficulties than with them. For example, although more young than older mothers lacked secondary school qualifications, 2/3 of young mothers did have such qualifications. A clear priority for further study is to understand why some young mothers fare much better than others (e.g., Zaslou et al., 1999). One further possibility left unexplored by our study is that giving birth at a young age may have advantages heretofore overlooked by research focused on psycho-social difficulties. In this regard, during open-ended discussions, many older mothers in our study said they envied the energy and vitality of young mothers.

Limitations of the research

The most obvious limitation of our study of young motherhood is that the sample families were selected on the basis of having twins. There are two potential limitations that could constrain generalising from

our findings to the general population of mothers. These concern 1) the base rates of certain outcomes in twin vs. non-twin families and 2) the differential effects of a multiple birth on young vs. older mothers.

Base rates. It is possible that the added burden of having two babies simultaneously may have influenced the base rates of some measures, and thus the present findings may not generalise to families that do not include twins. This would result in differences on outcome measures between twin families and non-twin families. For example, mother-child activities may have been curtailed in our study compared to typical British families, because it is more costly and cumbersome to take two children to the zoo than one. Similarly, relatively few of the unmarried twin mothers had a cohabiting partner. When asked about this many of the mothers laughed that 'No man would take on a woman with pre-school twins!' Research has compared twins versus singletons, and found that although twins are delayed behind singletons on language and cognitive skills at young ages (Lytton, Watts, & Dunn, 1987; Levy, Hay, McLaughlin, Wood, & Waldsman, 1996; Rutter & Redshaw, 1991), at older ages they do not differ on intelligence test scores (Posthuma, De Geus, Bleichrodt, & Boomsma, 2000). Neither do twins differ from singletons on behaviour problems (Gjone & Novik, 1995; Kendler, Martin, Heath, & Eaves, 1995; Levy et al., 1996; Moilanen et al., 1999; Simonoff et al., 1997; Van den Oord et al., 1995). However, very few studies have compared twin versus non-twin families on maternal characteristics or family social circumstances, the outcomes which are a focus of this paper. Although one study reported that mothers of twins spent less time talking to each child than did mothers of singletons (Lytton et al., 1987), another study found that a twin birth did not adversely affect mothers' emotional health compared to a singleton birth (Thorpe, Greenwood, & Goodenough, 1995). Overall, although the research is sparse, it appears that twins and their mothers do not differ markedly from other children and their mothers. In any case, because both the young and older mother groups in our study had twins this factor was held constant across families, and therefore it did not invalidate our comparison between young and older mothers.

Differential effects. Although both the young and older mothers had twins, it is possible that the added burden of having two babies may have affected younger and older mothers differently. This would compromise generalisation from one of the groups of twin-study mothers (young or older) to the general population of mothers it should represent. Many people assume coping with twins is harder on young mothers than on older mothers, and if this were true, it could exacerbate the difficulties of the young mother group in our study,

making them appear worse off than typical young mothers in Britain. This worry is probably unfounded, however, because close birth spacing (inherent in a twin birth) is a known characteristic of teen parenthood. As a result, the child-rearing difficulties of young mothers of twins may be similar to the difficulties faced by other young mothers, whose children are also closely spaced in age. Consistent with this, research suggests that depression, one indicator of child-rearing stress, is similarly high in mothers of closely spaced singletons and mothers of twins (Haigh & Wilkinson, 1989; Thorpe, Golding, MacGillivray, & Greenwood, 1991). Whereas young mothers of twins may represent the general population of young mothers more accurately than assumed, this same analysis suggests that older mothers of twins (who have close birth spacing) may not represent as well the general population of older mothers (because older mothers ordinarily space their children further apart). If this were true, the older mother group in our study would appear worse off than typical older mothers in Britain. To examine this, we compared means of our older mothers' group against national normative standards for measures on which such norms were available. We found that our sample of older mothers was very similar to the general population on their age at first birth, prevalence of a major depressive episode, and reading scores, and that their children were representative of the general population on IQ and behavioural problems. In the final analysis, if twinning limits the generalisability of our results, it is likely to have made older mothers more like typical young mothers on the burden of parenting closely spaced children, and this would have the net effect of reducing the differences between older and young mothers on measures related to child-rearing stress. For example, if the differences shown between young and older mothers in our findings were affected by twinning, then measures such as home crowding probably under-estimate the true differences in the national population.

Another limitation of this paper is that it only describes differences between contemporary young and older mothers, and does not explain how these differences come about. The E-Risk study, which sampled at-risk young mothers in the context of a twin design, is designed to make possible forthcoming studies attempting to disentangle nature and nurture in the effects of off-time-early motherhood on families and children. For now, we refer readers to the substantial body of survey research that has explored mechanisms and processes accounting for the difficulties faced by the families of young mothers (Fergusson & Woodward, 1999; 2000; Horwitz, Klerman, Kuo, & Jekel, 1991; Jaffee et al., 2001; Jaffee, 2002; Jaffee et al., in press; Maynard, 1997; O'Callaghan et al., 1999; Taniguchi, 1999; Wu & Martinson, 1993).

Implications for future research

Despite this large body of research, there are many unanswered questions about the processes leading to difficulties in young-mother families. In particular, more research is needed that can closely examine the proximal processes affecting young mothers and their families (Dunn, Davies, O'Connor, & Sturgess, 2000; Rutter et al., 1997). Research into proximal processes can help to identify primary risk mechanisms that may be modifiable. Solicitations for such research have been extended in 2001 by the Joseph Rowntree Foundation and the Department of Health. Findings in this paper suggest that research on proximal processes will require concerted effort and investment of resources if study samples are to represent all young mothers. We found that many young mothers have difficulties that interfere with recruitment into research programmes (e.g., frequent address changes), and many have difficulties which prevent them from responding to postal surveys (e.g., poor reading, low conscientiousness). Indeed, had we relied on our initial postal survey, more than one-third of the young mothers in this report would not have been studied. It is of utmost importance that researchers make special efforts to make research participation possible for hard-to-reach young mothers, because this group is likely to be the most needy of help, and the hardest for practitioners to reach with intervention programmes.

Our findings also indicate that young maternal age at first birth can be a good choice for researchers who need, as we did, an accurate and economical risk indicator for screening families to select high-risk samples for research in health and social science. Young maternal age at first birth is an easy-to-measure marker that reliably signals elevated rates of a variety of health, social, cognitive and behavioural problems in both women and children (Maughan & Lindelow, 1997; Nagin, Pogarsky, & Farrington, 1997).

Implications for policy

Although more research is needed to improve our understanding of the sources of young mothers' difficulties, policy can be informed by existing research, including the present findings. Firstly, our findings show that young mothers continue to experience difficulties today, suggesting that contemporary interventions are needed to prevent teen childbearing and to assist young women who do become mothers. New programmes are being evaluated in the UK, where the teen-age birth rate is the highest in western Europe (e.g., a pilot scheme to improve teen-aged mothers' access to education was announced in 2001; DfEE, 2001). Secondly, our findings show that the children of young mothers

evidence early-emerging difficulties (already apparent by age five), suggesting that interventions should begin as early as possible in the life of a young mother. Thirdly, our findings point to the need for policy-makers and practitioners to think broadly and inclusively about the difficulties challenging young mothers and their families. Young mothers experience problems in multiple life domains: education and literacy, employment and finances, neighbourhood and housing, mental health and substance abuse, lack of support from their children's fathers, and in their children's health and well-being. Given that many teen-aged mothers experience multiple difficulties, a high priority is to determine whether treatments addressing one primary domain can produce salutary changes in other domains or, alternatively, if multimodal interventions must simultaneously target the multiple difficulties faced by many young mothers (Yoshikawa, 1994). Fourthly, because the children of young mothers face difficulties (maltreatment and cognitive, behavioural and health problems) that are known to have long-lasting implications for young people's future success as parents, helping young mothers now may reduce harm to the social, mental and physical health of future generations.

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