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Parental divorce and adult family, social and psychological outcomes: the contribution of childhood family adversity

BRYAN RODGERS¹

PATRICIA GRAY¹

TANYA DAVIDSON¹

PETER BUTTERWORTH²

¹ National Centre for Epidemiology and Population Health, the Australian National University

² Centre for Mental Health Research, the Australian National University

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For more information

Research Publications Unit

Research and Analysis Branch

Australian Government Department of Families, Housing, Community Services and Indigenous Affairs

PO Box 7576

Canberra Business Centre ACT 2610

Phone: (02) 6244 5458

Fax: (02) 6133 8387

Email: publications.research@fahcsia.gov.au

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Executive summary

A large body of research evidence across developed countries has demonstrated significant long-term disadvantages for children from divorced compared with intact families of origin. These disadvantages range across family, social and psychological outcomes, and poor outcomes are roughly 50 to 100 per cent more likely for those from divorced families. Circumstantial evidence indicates that these disadvantages are not attributable to family separation itself but there have been relatively few studies attempting to establish what other factors contribute to such differences. One notable exception is the suggestion that financial hardship accounts for half of educational disadvantage seen in children raised in lone-parent families in the United States. There has also been considerable speculation internationally about the role of family conflict in explaining poor outcomes in children after parental divorce, but research findings have been inconsistent on this issue.

The present study aims to help answer this question by investigating reports from three generations of adults in the Canberra region, comparing those from divorced families with those brought up in families that stayed together. These samples of adult cohorts were studied in Wave 1 of the Personality and Total Health (PATH) Through Life Project. Individuals were randomly selected from the electoral rolls for Canberra, Australian Capital Territory and Queanbeyan, New South Wales, with participants aged 20 to 24 years studied in 1999–00, those aged 40 to 44 years studied in 2000–01 and those aged 60 to 64 years studied in 2001–02. Around 2,500 people within each of the three age cohorts completed questionnaires on hand-held computers.

The information obtained covered a broad range of adult family, social and psychological outcomes and responses to 17 items on childhood family adversity factors experienced up to age 16 years. Three stages of statistical analyses were carried out. In stage 1, poor adult outcomes were used as outcome variables in models with sex, age group (20 to 24 years, 40 to 44 years and 60 to 64 years), parental divorce and possible interaction terms between these factors as predictor variables. In stage 2, stepwise logistic regression models identified the set of adversities (in addition to parental divorce) that were predictors of each outcome variable even after adjustment for all other significant predictors. This second stage of analysis also determined the strength of association between parental divorce and each outcome after adjustment for other significant adversities. In stage 3, the sets of adversities identified in the previous stage were used to determine which factors contributed to the associations between parental divorce and each outcome, and to quantify the relative contributions of the factors in each set.

In stage 1 analyses, parental divorce was most strongly related to outcomes representing early transitions to adult roles. Other outcomes related to own relationship history and also failing to complete secondary education showed intermediate associations with parental divorce, while outcomes related to adult substance use and mental health were not so strongly associated. Most odds ratios were statistically significant, however, indicating poorer outcomes for those from divorced families, and many fell in the range of 1.5 to 2.5. The only non-significant association was between parental divorce and hazardous/harmful alcohol consumption.

In stage 2 analyses, the childhood adversities (in addition to parental divorce) that were most consistently related to poor adult outcomes were mother's and father's depression and mother's and father's drink/drug problems. Most other adversities were significant in some of the statistical models and only two (physical abuse by a parent figure and verbal abuse by a parent figure) were non-significant across all models. The odds ratios associated with parental divorce were typically reduced after adjustment for other adversities, by comparison with the odds ratios found in the stage 1 analyses. In two instances (depression and suicidal thoughts), parental divorce was no longer significant after such adjustments. However, the odds ratios for transitions to adult roles remained high (around 2.0) after adjustment.

In the stage 3 analyses, there was variety across outcome measures as to which adversities were most strongly implicated. Family conflict contributed the most to the differences between those from divorced and intact families for three outcomes (depression, suicidal ideation and having ever used marijuana), but did not feature in any of the other models. Mother's depression and mother's and father's drink/drug problems appeared most consistently across models but did not contribute substantially to explaining differences between those from divorced and intact families of origin. Generally, such differences were explained to some degree by a combination of adversities rather than any one adversity.

These results reinforced the pattern of earlier Australian and international research that children from divorced families experience long-term disadvantages by comparison with their peers from intact families. The particularly strong associations with early transitions to adult roles (for example, having a first child when still a teenager) were also in keeping with findings from several other countries.

Our findings have implications for policy and practice in relation to: (1) the strength of association between parental divorce and adult outcomes; (2) the type of adversity factors identified as contributing most to poorer outcomes for those from divorced families of origin; and (3) the similarity between adversities that contribute most to poor outcomes for those from divorced families of origin and those adversities that are important irrespective of family type.

The strength of association with parental separation can be illustrated using the findings for depression and applying the concept of population attributable risk (PAR). We found the prevalence of depression to be 9 per cent for those from divorced families and 6 per cent for those from intact families. Along with the estimate that about one in four Australian children will experience parental separation, the calculation of PAR% comes to 11.1 per cent. This means that if it were possible to bring down the prevalence of depression in those from divorced families to 6 per cent (that is, the same as for those from intact families) then this would reduce the burden of depression across the whole population by 11.1 per cent.

In relation to the adversities found to contribute to poorer outcomes for those from divorced families, it is an important message for services and families themselves that disadvantages may not be inevitable consequences of family separation itself, as this presents opportunities for intervention and amelioration. The particular factors identified in this study (family conflict, mother's depression, and mother's and father's drink/drug problems) are also important in both pointing to which families are most at risk and identifying what forms of intervention may have the greatest potential benefits. Although family conflict is currently recognised within the family law system as an important influence on children's wellbeing, the other three adversities identified here are less well addressed by current services, such as provided for through the Family Relationships Services Program (FRSP), whether due to a failure to recognise these problems or due to a lack of capacity to deal with them.

In regard to the similarity of adversity factors identified as contributing to poor outcomes for children from divorced families and those that operate irrespective of family type, this supports a broad view that the goals of initiatives for families in transition (for example, some FRSP subprograms) should overlap and be complementary with more general initiatives, such as found within the former Stronger Families and Communities Strategy.

This study has a number of limitations, including its retrospective design and its regionally-based sample, suggesting some caution in interpretation but not threatening the validity of the main conclusions. What the study could not do (and was not designed to do) was disaggregate the experience of adversity before the time of parental divorce from experiences after (and possibly as a consequence) of divorce. However, the results of this study should help refine measures for use in prospective longitudinal studies that would be better placed to address issues of temporal order and causal processes.

In addition to the need for such prospective studies, our findings also point to the area of early transitions to adult roles as requiring greater research attention. It is important to identify whether the greater risk of such transitions for children from divorced families is benign or whether it can lead to far-reaching and longer-lasting disadvantage.

1 Introduction

A large body of evidence from English-speaking developed countries delineates poorer outcomes for children from separated families by comparison to their peers raised in families that stay together (Amato 2001, 2010; Amato & Keith 1991a, 1991b; Pryor & Rodgers 2001; Rodgers & Pryor 1998). There is a shortage of evidence relating to physical health outcomes, but studies of family, social and psychological outcomes show consistent disadvantages for children from separated families of origin. The risk of poor outcomes is roughly 50 to 100 per cent greater than for children brought up with two original parents, irrespective of the type of outcomes investigated. Such differences have been reported for: social and emotional behaviour in childhood; education and adult socioeconomic attainment; aggressive and antisocial behaviour and delinquency; substance use; mental health in adolescence and adulthood; and family and intimate relationships in adolescence and adulthood (Pryor & Rodgers 2001). Studies in Australia typically report similar findings to those seen in other countries (ABS 2010; Dixon, Charles & Craddock 1998; D'Onofrio et al. 2006; Evans, Kelley & Wanner 2001, 2009; Goyne 2001; Hayatbakhsh, Najman, Jamrozik, Mamun & Alati 2006; Hayabakhsh, Najman, Jamrozik, Mamun, Williams & Alati 2006; Najman et al., 2004; Patton et al. 1996; Rodgers 1996b; Sanders, Halford & Behrens 1999; Wise & Edwards 2005; Zubrick et al. 1997) with the notable exception of results from the Australian Temperament Project that seem unexplained (Ruschena et al. 2005).

The increased risk of poor outcomes associated with parental separation is not ameliorated or exacerbated by parental remarriage; those brought up in stepfamilies for a part of their childhood fare no better or worse on average than those who remain with a lone parent after separation (Pryor & Rodgers 2001). Furthermore, risk seems not to be ameliorated by the passage of time; effect sizes for adult outcomes are comparable to those for differences seen in studies of childhood outcomes (Amato & Keith 1991a, 1991b). In one particular instance, the development of problem drinking, both cross-sectional and longitudinal findings have indicated that the greater risk found in people from divorced families of origin actually increases through the early adult years (Hope, Power & Rodgers 1998; Pryor & Rodgers 2001).

Circumstantial evidence has indicated that the poor outcomes associated with parental separation are not attributable to family breakdown itself. Findings across studies indicate that the pattern of poor outcomes is neither consistent with the idea of parental **loss** as a traumatic event nor with the disadvantage that could accrue from periods of parental **absence** (Pryor & Rodgers 2001). For example, several longitudinal studies have shown that behavioural and educational differences between children from divorced families and those from intact families already exist before families separate (Block, Block & Gjerde 1986; Cherlin et al. 1991; Doherty & Needle 1991; Elliott & Richards 1991a, 1991b; Strohschein 2005; Sun 2001). Similarly, studies examining adult outcomes have found that people who spent their entire childhood with both parents, but whose parents subsequently divorced, show the same increased risk of mental health and drinking problems as people whose parents divorced when they were children (Hope, Power & Rodgers 1998; Rodgers, Power & Hope 1997). Equivalent findings have since been reported for other adult outcomes including premarital cohabitation, first child born out of marriage, first partnership or marriage ending, being on welfare benefits, and living in social housing (Furstenberg & Kiernan 2001).

Although such findings suggest that factors other than family separation are responsible for children's poorer outcomes, relatively few studies have attempted to establish what other variables contribute to this disadvantage. Indeed, a more common approach has been to treat potential explanatory factors as confounders in statistical analysis, so that the extent of differences between children from divorced and intact families are 'adjusted' by such factors as social class, while the role of these additional factors is essentially ignored. Those that have adopted the approach of quantifying the contribution of such risk factors have typically focused on single-factor explanations. Socioeconomic hardship and conflict are the most commonly studied forms of adversity. For example, McLanahan and Sandefur (1994), from their analyses of several US data sets, concluded that about half of the educational disadvantage found in children living in lone-parent families was attributable to financial hardship. The relevance of conflict in conjunction with parental divorce

has evaded succinct explanation in spite of research attention (Amato 1993; Amato & Booth 1997; Hanson 1999; Jekielek 1998; Kelly & Emery 2003; Mechanic & Hansell 1989) and considerable speculation.

Studies conducted in Australia have rarely attempted to explain why children from divorced families have poorer long-term outcomes than children brought up in families that remained together. Of 25 studies reported up to 1995, none addressed this issue (Rodgers 1996b). From the studies published since that review, three using general population samples have shown that the poorer outcomes for children from separated families are still seen after adjustments for parental socioeconomic background (parental education and/or occupational status and income) when investigating teenage depression (Patton et al. 1996), educational attainment (Evans, Kelley & Wanner 2001) and adult occupational success (Evans & Kelley 2002), but none of these studies reported the strength of association before making adjustments. One further study using a general population sample found that unadjusted differences between 14 year-old children in lone-mother and two-parent families remained significant for a measure of externalising behaviour problems but became non-significant for other outcomes (internalising problems, smoking and non-verbal reasoning) when adjusted for age of mother, income and maternal grandfather's occupational status (Najman et al. 2004). One study of university psychology students found that adjusting for both socioeconomic status and parental conflict reduced initially significant differences in externalising behaviour problems to non-significant levels when contrasting students from married and divorced families (Dixon, Charles & Craddock 1998). The reduction in mean difference between the groups following adjustment was around half (53 per cent) of the initially observed difference. However, no such reduction was found for differences in internalising behaviour problems (that is, the opposite of the pattern reported by Najman et al. (2004)). This study was very unusual in reporting **lower** internalising scores for male students from divorced families, unlike the expected higher scores for female students from divorced families. One large study of male applicants for the Australian Army (Goyne 2001), conducted over a three-year period (1994–96), reported findings for those from separated/no conflict families (n=4,019), separated/conflict families (n=1,349), not-separated/no conflict families (n=7,345) and not-separated/conflict families (n=509). The high rate of family separation overall (over 40 per cent) is a notable feature of this population. Family conflict was more strongly related to all outcomes investigated than was family separation, including completed education, disruptiveness at school, drug use, criminal record, and eventual selection for army service. However, the extent to which family conflict could account for differences between those from separated and not-separated families could not be answered in a simple way because of observed interactions between the two factors. In general, family separation was not relevant for those who were raised in high conflict families, whereas some small but statistically significant disadvantages were associated with family separation for those from no-conflict backgrounds. One characteristic, living away from home, was consistently and strongly linked to family separation irrespective of conflict.

A series of publications using a sample of twins drawn from the Australian National Health and Medical Research Council Twin Registry (the Longitudinal Adult Twin Study) has utilised a genetically informed design to establish the extent to which differences between children from separated and non-separated families (where the twins were the parents) may be due to selection factors, including genetic confounds. Outcomes where significant differences were initially observed included years of education, failing a grade at school, age at first intercourse, having a baby before 20 years of age, marijuana use, depressed mood and suicidal ideation (D'Onofrio et al. 2006). With the use of statistical and methodological controls, the differences for educational outcomes were roughly halved but differences for the other outcomes were more robust.

Although research in Australia and overseas has focused on the role of socioeconomic background and family conflict, children from separated families are known to be exposed to a far more diverse constellation of early risk factors, all of which might be expected to contribute to poor social and psychological outcomes. These factors range from experiences considered to have very serious implications but which are fortunately uncommon; for example, parental sexual abuse through to parental behaviours and styles that vary continuously in the general population yet show some correlation with family structure (Andrews et al. 2004; Bagley & Ramsey 1985; Deater-Deckard & Dunn 1999; Hope, Power & Rodgers 1999; Mullen et al. 1996; Robins, Locke & Regier 1991; Rodgers 1995, 1996a). It should be kept in mind that such factors may exert their influence before, during or subsequent to parental separation.

The specific contributions of this diversity of potential risk factors can only be quantified through a more systematic assessment of the full range of adversity than has been conducted previously, and the present project represents an initial attempt at this task. A long-term goal in this line of research would be to investigate the role of early adversity using prospective longitudinal designs. To inform such research, the immediate objective is to utilise retrospective measurement to refine the list of candidate factors. The present project adopts the latter approach using cross-sectional data obtained from samples of adults representing three birth cohorts. These data included reports of a wide range of childhood family adversities (Rosenman & Rodgers 2004).

1.1 Aims

The aims of this project are to:

1. quantify differences between adults from divorced families of origin and those from intact families across a broader range of family, social and psychological outcomes than covered in previous studies
2. identify what aspects of childhood adversity and abuse contribute to the differences found in (1) and determine whether parental separation has any residual (that is, 'direct') association with poor outcomes after adjusting for other adversities
3. investigate whether the findings in (1) and (2) vary across birth cohorts.

2 Method

2.1 Sample

The Personality and Total Health (PATH) Through Life Project is a community survey of 7,485 people aged 20 to 24 years, 40 to 44 years and 60 to 64 years, living in Canberra (Australian Capital Territory) and Queanbeyan (New South Wales), Australia. It is planned to study each cohort every four years for 20 years. Results here concern the first wave of interviews. The Australian Electoral Rolls were used as sampling frames. Enrolment to vote is compulsory for Australian citizens with very rare exceptions (being of unsound mind, serving a prison sentence of five years or more, and having been convicted of treason or treachery).

Only decade age ranges were available from the Electoral Commission at the time of recruitment of the 20 to 24 and 40 to 44 year olds, in 1999 and 2000 respectively. Consequently, letters were sent to 12,414 people aged 20 to 29 years, inviting participation of 20 to 24 year olds. Of these, 5,058 were outside the required age range, 1,061 were known to have moved from the area, 2,190 were not found, 1,701 refused or could not complete the interview because of poor literacy in English, and 2,404 (58.6 per cent of those identified and not out of scope) were interviewed. For the 40 to 44 year olds, 9,033 were sent letters, 4,222 of whom were discovered to be out of the required age range, 280 were no longer in the area, 612 were not found, 1,389 refused or could not complete the interview because of poor literacy in English and 2,530 were interviewed (64.6 per cent of those identified and not out of scope). A law change prior to the recruitment of 60 to 64 year olds in 2001 allowed the release of more specific age group information for this cohort. Letters were sent to 4,831 persons, of whom 34 were outside the required age range, 182 no longer lived in the area, 28 had died, 209 were not found, 1,827 refused or could not complete the interview because of poor literacy in English, and 2,551 were interviewed (58.3 per cent of those identified and not out of scope). The total sample consisted of 1,163 males and 1,241 females aged 20 to 24 years, 1,193 males and 1,337 females aged 40 to 44 years, and 1,319 males and 1,232 females aged 60 to 64 years.

An invitation letter notified potential participants that an interviewer would contact them. Those who accepted were visited at a convenient location, usually the participant's home, or (less often) came to the Centre for Mental Health Research at The Australian National University (ANU). They each received an information sheet outlining the purpose of the study, who would have access to the data, and what uses the information could be put to. Written consent was required before taking part in interview and testing procedures. Participants completed the main questionnaire themselves using a hand-held computer and cognitive tests were administered by the interviewer. The Human Research Ethics Committee of the ANU approved the study protocol.

2.2 Measures

Original questionnaire items used in this project are shown in Appendix A. Self-completion questions presented on the hand-held computer included asking about the respondent's childhood up to the age of 16 years. Seventeen specific questions were asked about childhood adversity, and the distribution of reports by age and sex has been reported previously (Rosenman & Rodgers 2004). Six of these items covered lack of affection, nervous or emotional trouble or depression, and trouble with drinking or other drug use in father and mother figures respectively. Two items covered conflict in the household and experience of parental divorce or permanent separation. Eight items covered experience of: neglect; a strict authoritarian upbringing; parental verbal abuse; humiliation, ridicule, bullying or mental cruelty from a parent (that is, psychological abuse); witnessing physical or sexual abuse in the family; physical abuse by a parent; receiving too much physical punishment; and sexual abuse by a parent. Physical abuse, as distinct from other physical punishment,

required being punched, kicked, hit or beaten with an object, or needing medical treatment. One item inquired of growing up in poverty or financial hardship. An additional open-ended 'catch-all' question allowed the description of other types of mistreatment not covered by the 17 closed questions. Three further items asked about more positive aspects of upbringing: 'I had a happy childhood'; 'my parents did their best for me'; and 'I had a normal upbringing'.

Several of the childhood adversity items were adopted from the Parental Bonding Instrument (Parker 1989), the British National Survey of Health and Development (Rodgers 1996a) and the US National Comorbidity Survey (Kessler, Davis & Kendler 1997). Others were derived from a previous cross-sectional study in the Canberra region (Henderson et al. 1998) that utilised questions with an open-ended response format. These were classified by two 'judges' independently and used to construct new closed items for the PATH Project. An indication of the comprehensive nature of the final 17 closed adversity items was given by the very low frequency of endorsement of the open-ended question. Further, most of these open-ended responses did, in fact, refer to events or circumstances covered by the closed adversity items and were appropriately back coded into responses to those 17 items. The majority of the outstanding open-ended responses referred to extrafamilial adversity that was not the focus of the present study. Three of the adversity items had multiple response frames: father's affection, mother's affection (from the Parental Bonding Instrument) and level of conflict in the household (from the US National Comorbidity Survey). These were recoded to 0/1 scoring to reflect fathers and mothers who were described as 'not at all' affectionate and households where there was 'a lot' of conflict.

A number of outcome measures suited to the aims of this project were available from the detailed information collected as part of the Wave 1 interviews. These covered the domains of mental health, educational achievement, substance use, transitions to adult roles, and own relationship history in adulthood. The specific measures used as dependent variables in analysis were: completion of secondary education, completion of or currently undertaking tertiary courses, current cigarette smoking, hazardous or harmful alcohol consumption, ever having used marijuana, high depression level, high anxiety level, suicidal thoughts, age at first sexual intercourse, age at leaving the parental home, age when first lived with a partner, age when first child was born, being currently married (or living in a de facto relationship), having ever had children, being currently divorced or separated, having ever divorced or separated as adults, and experiencing a relationship breakdown in the six months before interview.

As the youngest cohort included individuals who were only 20 years old at the time of interview, the outcomes related to own divorce or separation in adulthood were only investigated for the 40 to 44 and 60 to 64 year cohorts. For the same reason, two of the measures representing transitions to adult roles were dichotomised to identify those who first lived with a partner before they were 20 years of age and those whose first child was born before they themselves were 20 years of age. The other measures of transition to adult roles were dichotomised to identify those who first had sexual intercourse before age 16 years (that is, the age of legal consent), and those who left the parental home before 17 years. For age at first sexual intercourse all of the individuals who reported an experience under the age of 12 were recoded as missing data, as it was considered that these could include cases of sexual abuse. Whenever participants disclosed sexual abuse to interviewers or queried how to respond to this question in circumstances of abuse, the interviewers informed participants not to include such experiences in reporting the age of first sexual intercourse.

Recent alcohol consumption was measured using three items of the World Health Organisation (WHO) Alcohol Use Disorders Identification Test (AUDIT; Saunders et al. 1993). Weekly consumption was initially estimated from responses to questions about usual frequency of drinking and the number of standard drinks consumed on typical drinking days (Redman et al. 1987; Shakeshaft, Bowman & Sanson-Fisher 1999). An Australian standard drink contains 10 grams of alcohol. These estimates were then adjusted to take into account how often participants consumed six or more standard drinks on one occasion, as indicated in their responses to the third AUDIT item on binge drinking. The final estimate of weekly consumption was dichotomised to identify those drinking at levels defined as **risky** or **high risk** in the long term, that is, over 28 standard drinks per week for men and 14 standard drinks per week for women (NHMRC 2001), and denoted here as hazardous or harmful

consumption levels. Although more recent Australian drinking guidelines have been published, the 2001 guidelines are more appropriate for research purposes and are closer to thresholds used in other countries such as the UK (Caldwell et al. 2008; Department of Health 1995).

Depression and anxiety were assessed using the Goldberg scales (Goldberg et al. 1988). These scales have nine yes/no items each and were summed to yield 0 to 9 scores. These totals were dichotomised to identify participants with high scores (greater than six for depression and greater than seven for anxiety) for use as binary outcome measures. Suicidal ideation was assessed by five yes/no items used previously in the British National Survey of Health and Development (Lindelow, Hardy & Rodgers 1997). These asked whether, in the past year, participants have ever (1) felt that life was hardly worth living, (2) thought they really would be better off dead, (3) thought about taking their own life, (4) had made plans to take their own life and (5) had attempted to take their own life. For the present report, responses to the five items were summed and then dichotomised to distinguish 0 or 1 versus 2 or more endorsements.

2.3 Data analysis

STATA (version 8) was used for all analyses, which were carried out in three stages. Stage 1 analyses were conducted for all dependent variables (outcomes) selected for this study. For each dependent variable, a logistic regression model was specified using only three independent variables: sex, age group and parental divorce. An interaction term for sex and age group was also included in these models and the significance of interactions of parental divorce with sex and of parental divorce with age group was tested. Specifically, these interactions indicated where the strength of association between parental divorce and an outcome varied between men and women or across age groups respectively. The models from this first stage of analysis are referred to as **simple** models throughout this report. These models addressed the first and third aims of the project.

The second stage of analysis involved a series of logistic regression models for each dependent variable (except where no significant associations with parental divorce were found for an outcome in the initial simple model). The starting point for each series was the simultaneous inclusion of all other 16 adversity variables along with parental divorce, sex, age group, and any significant interaction terms identified in the simple model. Non-significant adversity factors were then removed from this model one at a time, commencing with the least significant (that is, highest p -value) until all remaining adversity factors were significant at the $p < 0.05$ level. This second stage established whether parental divorce (or any interaction term involving parental divorce) remained as a significant predictor in the final step for each outcome and, if so, what the strength of this association was after adjustment for other significant adversity factors. It also identified the set of other adversities relevant to each dependent variable that had the potential to account for some or all of the difference in that outcome between those from divorced and intact families, whether across all age groups or for particular age groups. The final models from this second stage of analysis are referred to as **complex** models throughout this report.

In the third stage of analysis, the set of adversities identified for each dependent variable in stage 2 was used to determine the contributions of individual adversity factors to the association between parental divorce and that particular outcome. This, again, followed a series of logistic regression models but commenced instead with simple models and adding one adversity at a time to the model for each outcome. The criterion determining which adversity was entered at each step was the factor (from the relevant set identified in stage 2) that produced the largest reduction in odds ratio (OR) for parental divorce. This process continued until the full set of adversities were included in the model, with ORs for parental divorce being recorded for every step. For these analyses, the change in OR between the initial model and any subsequent step can be expressed as a percentage and therefore provides an estimate of the extent to which the inclusion of additional adversity factor mediates (or statistically accounts for) the association previously observed between parental divorce and an outcome (Mackinnon et al. 2002). As an OR is not a linear index of association and because an OR of 1.0 represents a null association, this percentage change is calculated following logarithmic transformation as follows:

$$\text{Percentage change in log of odds ratio} = \frac{\log(OR_1) - \log(OR_2)}{\log(OR_1)} * 100\%$$

This percentage change can also be calculated from the regression weights provided by logistic regression analysis:

$$\text{Percentage change in } b = \frac{b_1 - b_2}{b_1} * 100\%$$

The stage 3 models were conducted only for those age groups where significant differences in an outcome were found between participants from divorced and intact families of origin. In practice, this obviated the need for interaction terms between parental divorce and age group in this final stage. Stage 2 and stage 3 models were relevant to the second and third aims of the project.

2.4 Presentation of results

A conventional and convenient way to present findings from logistic regression analyses is to report odds ratios (ORs) indicating the strength of association between each predictor variable and the outcome of interest. ORs are easily obtained from multiple logistic regression models and have the same meaning as ORs derived from simple 2×2 tables (the cross product), that is, the ratio of the odds of an outcome when a risk factor is present, relative to the odds when it is absent. In multiple regression, the OR for a predictor variable of interest is adjusted for other factors in the model. ORs have the benefit of providing a simple metric, with ratios greater than 1.0 representing increased risk and those below 1.0 indicating decreased risk. They offer a means of comparing the strength of association across several predictors for the same outcome or for comparing across several outcomes for the same predictor variable. However, ORs are not as robust as some effect size indexes and are sensitive to variations in base rates; caution is needed when base rates vary appreciably.

One limitation of ORs is that they do not readily communicate the nature of interaction terms. Typically, separate ORs are reported for each main effect in an interaction term and additional ORs (the number depending on the degrees of freedom of the relevant term) are reported for significant interactions. These are not easily translated into the pattern of findings represented by the combination of the separate terms. To avoid this problem, we ran additional models using STATA, replacing interaction terms (when significant) and their associated main effects with a categorical variable representing all the subgroups embraced by the interaction of interest. The overall fit of such models is the same as the original model (because the underlying statistical decomposition is identical) but the odds ratios obtained provide a more convenient way of interpreting the results. Of course, one subgroup must still be identified, often arbitrarily, as the point of comparison for all other subgroups, in the same way that a comparison group is needed for the interpretation of ORs for main effects.

An additional drawback of ORs, whether for main effects or interaction terms, is that they do not convey the absolute likelihood of an outcome. As the dependent variables in logistic regression analyses are often tangible outcomes (for example, failing to complete secondary education) then it is often helpful to present findings that give a direct representation of the absolute likelihood of the outcome and not just the relative odds. A comparison between the likelihood of children from divorced and intact families not completing high school (say, 35 per cent and 20 per cent respectively) can be understood intuitively. This form of comparison can be obtained from multiple logistic regression in STATA using the **predict** command in conjunction with the **adjust** syntax, providing the contrast of interest after adjustment for other main effects. Such predicted probabilities, which can be presented as percentages, are especially useful when models are extended to include many additional factors but focus remains on the association between a particular predictor variable of interest, such as parental divorce, and a given outcome.

The two forms of presentation outlined above were utilised extensively in this project, including some analyses where they were used in combination.

3 Results

3.1 Prevalence of parental divorce and other childhood adversity

Parental divorce up to age 16 years was reported by 21.5 per cent of 20 to 24 year olds, 12.0 per cent of 40 to 44 year olds and 10.1 per cent of 60 to 64 year olds. The prevalence of other reported adversities for all age groups combined is shown in Table 1; these varied from 23.4 per cent for mother's depression through to 1.1 per cent for being sexually abused by a parent figure.

3.2 Associations between parental separation and outcomes

The associations between parental separation and a range of adult outcomes have been reported previously for the PATH project (Rodgers & Stitzel 2005). Odds ratios for outcomes where no sex or age group interactions were found are shown in Figure 1. Results for three outcomes where interaction terms were significant (anxiety, leaving the parental home before 17 years, and not completing or currently undertaking tertiary education) are presented later (Figures 2 to 5). These three all involved interactions with age group, including one with a three-way interaction of parental separation by sex by age group. No other sex by parental separation interactions were found, consistent with the existing literature that long-term disadvantages associated with parental separation are similar for males and females (Amato 1993; Rodgers & Pryor 1998).

Table 1: Prevalence of other childhood adversities

Childhood adversity	%
Mother had depression	23.4
Father had drinking/drug problem	17.5
A lot of household conflict	17.1
Father had depression	16.9
Strict/authoritarian upbringing	15.9
Poverty or financial hardship	11.6
Too much physical punishment	8.2
Father not affectionate	7.8
Verbally abused by parent	6.5
Humiliated/ridiculed/bullied	5.9
Mother had drinking/drug problem	5.6
Witnessed physical/sexual abuse	5.5
Physically abused	5.2
Mother not affectionate	2.7
Neglected	1.6
Sexually abused	1.1

Many of the odds ratios in Figure 1 are consistent with the expectation that children from divorced families would have an increased likelihood of experiencing poor outcomes in adulthood at a level that is 50 to 100 per cent greater than seen for children from intact families. Some were below 1.5 and this was most evident for hazardous/harmful alcohol consumption, the only instance where it was not significantly greater than unity (OR=1.21; 95% CI 0.94–1.57). Three odds ratios were greater than 2.0 and it was notable that these were all for outcomes in the domain of transitions to adult roles. The confidence intervals for all odds ratios are shown in Table B1.

Figure 1: Odds ratios for parental divorce across outcomes: adjusted for age, sex and age by sex interaction

Predicted percentages for all outcomes included in Figure 1 are shown by divorced and intact family background in Table 2. The column for simple models presents values adjusted for sex, age group, and the interaction term between sex and age group.

Table 2: Predicted percentages across outcomes by divorced and intact family background

Outcome	Simple model	
Depression	Divorced	9.0%
	Intact	6.0%
	<i>p</i> -value	<0.001
Suicidal thoughts	Divorced	14.7%
	Intact	11.0%
	<i>p</i> -value	<0.001
Secondary education (not complete)	Divorced	76.9%
	Intact	66.8%
	<i>p</i> -value	<0.001
Hazardous/harmful alcohol use	Divorced	6.2%
	Intact	5.9%
	<i>p</i> -value	0.141
Smokes cigarettes now	Divorced	25.9%
	Intact	17.7%
	<i>p</i> -value	<0.001
Ever used marijuana	Divorced	61.1%
	Intact	53.3%
	<i>p</i> -value	<0.001
Age first sexual intercourse	Divorced	13.6%
	Intact	6.3%
	<i>p</i> -value	<0.001
Age first lived with partner	Divorced	23.2%
	Intact	12.2%
	<i>p</i> -value	<0.001
Age when first child was born	Divorced	7.4%
	Intact	2.8%
	<i>p</i> -value	<0.001

3.3 Parental divorce by age group interactions

Two outcomes, anxiety and leaving the parental home before 17 years, showed significant two-way interaction terms between parental divorce and age group. A categorical variable representing the six divorce by cohort groups was used to obtain predicted percentages from simple models and these are shown in Figures 2 and 3 respectively. It can be seen that the difference in anxiety between people from divorced compared to intact families was considerably greater in the 60 to 64 years age group relative to the differences in the two younger cohorts (Figure 2). Indeed, the differences for the younger cohorts were not significant. As well as the

interaction term of interest, Figure 2 shows the generally lower level of anxiety in the 60 to 64 years age group compared to the younger cohorts, consistent with other general population studies of anxiety across the age span (Andrews et al. 1999).

Figure 2: Predicted percentages for anxiety by age and parental divorce^(a)

(a) Adjusted for sex.

For leaving the parental home before 17 years (Figure 3), no difference was found between people from divorced and intact families in the youngest cohort, whereas differences were found for the two older cohorts in the expected direction (that is, greater likelihood of leaving home before age 17). In the 40 to 44 years age group, for example, the likelihood of leaving home early for those from divorced families (27.6 per cent) was double that found in those from intact families (13.8 per cent). In addition to the parental divorce by age interaction term, Figure 3 also illustrates the greater likelihood of leaving the parental home before 17 years in the youngest cohort, especially those from intact families. In respect of leaving home at an early age, today's young adults as a whole are similar to previous generations from divorced families.

Figure 3: Predicted percentages for leaving the parental home before 17 years by parental divorce and age^(a)

(a) Adjusted for sex.

One outcome, not completing or currently undertaking tertiary education, revealed a significant three-way interaction term between parental divorce, age group and sex. A categorical variable representing the 12 divorce by sex by cohort groups was used in further analysis to obtain predicted percentages for each group. This simple model necessarily produces the actual observed percentages for the 12 groups in the sample. These percentages are shown in Figures 4 and 5 for men and women respectively. From these, it can be seen that the interaction term reflects a reversal in women aged 40 to 44 years, where those from divorced families were less likely not to have completed tertiary education (that is, they were **more** likely to have completed tertiary study than similar aged women from intact families). The reason for this is not obvious and it could be a chance finding (that is, Type 1 error). In addition to this unexpected finding, the figures show the anticipated trends across age groups that reflect the greater availability of tertiary education in recent times and the stronger age trend across women compared to men (as tertiary education moved towards a more even sex balance).

Figure 4: Predicted percentages for not completing tertiary education by age and parental divorce: male only

Figure 5: Predicted percentages for not completing tertiary education by age and parental divorce: female only

3.4 Own partner relationships: outcomes relevant to 40 to 44 years and 60 to 64 years age groups

As well as the information collected for all three cohorts on transitions to adult roles (that is, age when first had sex, age at leaving the parental home, age when first lived with partner, and age when had first child) additional information was collected on own partner relationships and parenthood, including being currently unmarried/unpartnered, ever having had children, being currently separated/divorced, ever having separated/divorced, and a relationship having ended in the past six months. This information was of less relevance to the 20 to 24 years age group compared to the older cohorts, as the majority of the youngest group were not living with (and had not previously lived with) partners at the time of data collection. Analyses of these outcomes were, therefore, confined to the 40 to 44 years and 60 to 64 years age groups.

Table 3 shows the predicted percentages, comparing those from divorced with those from intact families, for each outcome along with the odds ratios obtained from multiple logistic regressions. These values are adjusted for age group, sex, and the interaction between age and sex only, comparable to the approach used earlier for the simple models shown in Figure 1 and Table 2. No significant interaction terms involving parental divorce (with sex and/or age group) were found for any of the present outcomes.

One of the five outcomes in Table 3 showed no significant difference between those from divorced and intact families of origin, that is, ever had children. The other four outcomes were more prevalent for those from divorced families of origin. The odds ratios for these associations were all between 1.52 and 1.77 and therefore comparable to the strength of associations reported previously for other outcomes (Figure 1 and Table 2). The confidence intervals for these odds ratios are presented in Table B1.

Table 3: Predicted percentages and odds ratios across outcomes: 40 to 44 years and 60 to 64 years age groups only

Outcome		Simple model	OR
Currently unmarried	Divorced	27.2%	1.52
	Intact	19.8%	1.00
	<i>p</i> -value	<0.001	
Ever had children	Divorced	9.0%	0.93
	Intact	9.1%	1.00
	<i>p</i> -value	0.640	
Currently separated or divorced	Divorced	17.8%	1.75
	Intact	11.0%	1.00
	<i>p</i> -value	<0.001	
Ever separated	Divorced	40.5%	1.73
	Intact	28.2%	1.00
	<i>p</i> -value	<0.001	
Relationship ended in last six months	Divorced	3.1%	1.77
	Intact	1.8%	1.00
	<i>p</i> -value	0.021	

3.5 Adjusting for associations with other adversities

Stage 2 of the program of analysis involved ascertaining which childhood adversities other than parental divorce contributed to the prediction of each dependent variable. One product of this stage was the quantification of the associations between parental divorce and each outcome after adjustment for other adversity factors. A further purpose was to identify the relevant sets of adversity factors that had the potential to account for some part (at least) of the initial associations between parental divorce and the dependent variables seen in the stage 1 analyses.

Figure 6 shows the odds ratios between parental divorce and each outcome, before and after adjustment for other childhood adversities (simple and complex models respectively). The ORs for simple models are the same as those shown in Figure 1. In every instance, the ORs were reduced in the complex models and in two cases these were no longer significantly greater than unity (for depression and suicidal thoughts) in addition to the already non-significant OR for hazardous or harmful alcohol consumption. Parental divorce remained as a significant predictor for all six other adult outcomes. The ORs in the complex models remained especially high, at around 2.0, for the three outcomes involving transitions to adult roles. Confidence intervals for ORs in the complex models are shown in Table B1.

Figure 6: Odds ratios for parental divorce across outcomes: comparison between simple and complex models

The associations between parental divorce and outcomes are illustrated further in Table 4 using predicted percentages for divorced and intact families, with and without adjustment for other adversities. The left-hand column for simple models is the same as shown earlier in Table 2 and the right-hand column for complex models presents the predicted percentages with further adjustment for other significant adversities. The predicted percentages for the complex models necessarily reflect the magnitude of the odds ratios already shown in Figure 6. However, they also indicate the absolute magnitude of the various outcomes in those from divorced and intact families, following adjustment for other childhood adversities. Differences are seen for

such outcomes as completing secondary education, cigarette smoking and marijuana use, although these are not large. The differences for outcomes representing transitions to adult roles are larger, such as the likelihood of living with a partner or of having a first child born before 20 years of age.

Table 4: Predicted percentages across outcomes by divorced and intact family background: comparison between simple and complex models

Outcome		Simple model	Complex model
Depression	Divorced	9.0%	5.9%
	Intact	6.0%	5.5%
	<i>p</i> -value	<0.001	0.467
Suicidal thoughts	Divorced	14.7%	10.2%
	Intact	11.0%	10.4%
	<i>p</i> -value	<0.001	0.779
Secondary education (not complete)	Divorced	76.9%	77.3%
	Intact	66.8%	69.9%
	<i>p</i> -value	<0.001	<0.001
Hazardous/harmful alcohol use	Divorced	6.2%	6.2%
	Intact	5.9%	5.9%
	<i>p</i> -value	0.141	0.638
Smokes cigarettes now	Divorced	25.9%	23.4%
	Intact	17.7%	17.7%
	<i>p</i> -value	<0.001	<0.001
Ever used marijuana	Divorced	61.1%	64.2%
	Intact	53.3%	59.8%
	<i>p</i> -value	<0.001	0.023
Age first sexual intercourse	Divorced	13.6%	11.5%
	Intact	6.3%	6.3%
	<i>p</i> -value	<0.001	<0.001
Age first lived with partner	Divorced	23.2%	19.9%
	Intact	12.2%	11.2%
	<i>p</i> -value	<0.001	<0.001
Age when first child was born	Divorced	7.4%	5.8%
	Intact	2.8%	2.6%
	<i>p</i> -value	<0.001	<0.001

Similar complex modelling was applied to those dependent variables for which the significance of parental divorce varied across the three age cohorts under study or where the outcomes were only pertinent to the 40 to 44 year olds and 60 to 64 year olds. These included anxiety (carried out only for 60 to 64 year olds), leaving the parental home before age 17 and the three significant outcomes relating to adult partner

relationships shown in Table 3 (carried out only for 40 to 44 year olds and 60 to 64 year olds). Completion of tertiary education was omitted from the complex modelling because the three-way interaction term (shown in Figures 4 and 5) makes interpretation of findings problematic and the criterion of reducing the odds ratio for parental divorce could not be applied to the 40 to 44 age group where the odds ratio was already less than unity in the simple model for women.

Adjusting for other childhood adversities slightly reduced the association between parental divorce and anxiety for the 60 to 64 years age group where the OR in the complex model was 2.80 (95% CI 1.70–4.62) compared with 3.14 (95% CI 1.92–5.13) in the simple model. The corresponding predicted percentages from these models are shown in Table 5.

Table 5: Predicted percentages for anxiety by divorced and intact family background for 60 to 64 years age group only: comparison between simple and complex model

Outcome		Simple model	Complex model
Anxiety	Divorced	8.9%	7.4%
	Intact	3.0%	2.8%
	<i>p</i> -value	<0.001	<0.001

Adjusting for other childhood adversities also led to a small reduction in the association between parental divorce and leaving the parental home before age 17 (for 40 to 44 years and 60 to 64 years age groups only). The odds ratio in the simple model was 2.18 (95% CI 1.79–2.66) and in the complex model this was reduced to 1.93 (95% CI 1.57–2.38). The corresponding predicted percentages from these models are shown in Table 6.

Table 6: Predicted percentages for leaving the parental home by divorced and intact family background for 40 to 44 years and 60 to 64 years age groups only: comparison between simple and complex model

Outcome		Simple model	Complex model
Leaving home before age 17	Divorced	29.4%	26.4%
	Intact	16.0%	16.0%
	<i>p</i> -value	<0.001	<0.001

Findings for the remaining outcomes studied in the 40 to 44 years and 60 to 64 years age groups are summarised in Table 7. After adjustment for other childhood adversities, the association between parental divorce and relationship breakdown in the past six months was no longer statistically significant. It should be noted that the odds ratio in the complex model was of a similar order to those seen for other outcomes in Table 7, but that the relatively low prevalence of this outcome (around 2 per cent) placed a constraint on the statistical power of this analysis. Significant associations remained for currently being unmarried, currently being separated or divorced, and ever having divorced or separated. The odds ratios for these three outcomes were 1.39, 1.63 and 1.58 respectively; not appreciably lower than the ORs from the simple models shown in Table 3. The confidence intervals for these ORs are shown in Table B1.

Table 7: Predicted percentages and odds ratios across outcomes for 40 to 44 years and 60 to 64 years age groups only: complex models

Outcome		Complex model	OR
Currently unmarried	Divorced	25.7	1.39
	Intact	19.9	1.00
	<i>p</i> -value	0.002	
Currently separated or divorced	Divorced	16.7%	1.63
	Intact	11.0%	1.00
	<i>p</i> -value	<0.001	
Ever separated	Divorced	38.5%	1.58
	Intact	28.3%	1.00
	<i>p</i> -value	<0.001	
Relationship ended in last six months	Divorced	2.6%	1.54
	Intact	1.7%	1.00
	<i>p</i> -value	0.085	

These long-term associations between parental divorce and own relationship histories were further investigated to establish whether they could be the eventual sequelae of early transitions to adult roles reported on previously. This was carried out by adding a variable into the complex models that represented the number of early transitions made by each individual across the four transition measures: age when first had sex, age of leaving the parental home, age when first lived with a partner and age when had first child. Adding this variable into the models had a small impact on accounting for the differences in likelihood of currently being unmarried and of marital breakdown between those from divorced and intact families of origin, but most of the differences were unexplained. The results for being currently separated or divorced and ever having separated are given as examples in Figures 7 and 8 respectively.

Figure 7: Predicted percentages for currently being separated, by divorced and intact family of origin: complex models with and without adjustment for early role transitions

Figure 8: Predicted percentages of ever being separated, by divorced and intact family of origin: complex models with and without adjustment for early role transitions

The particular childhood adversities that were independently significant in the complex models for each outcome variable are summarised in Table 8. (The model predicting tertiary education is omitted from this table due to the three-way interaction term discussed earlier.) It should be noted that many of these adversities showed significant associations across outcomes when considered as simple pairwise associations, whereas this table relates to multiple logistic regression models and identifies predictors that made a unique contribution in such models. The four adversities that show the most consistent independent associations

with adult outcomes were father's drink/drug problems, mother's drink/drug problems, father's depression and mother's depression, which were each significant in six or seven of the 14 models. Only two variables, physical abuse and verbal abuse, did not have a significant independent association with any of the outcomes, and sexual abuse was only independently predictive of one outcome (ever been divorced or separated). The remaining adversities were significant in two to five of the complex models.

3.6 Aspects of childhood adversity contributing to differences between those from divorced and intact families

The third stage of data analysis determined which specific adversity factors contributed to associations between parental divorce and individual outcome measures, and these analyses are summarised in Appendix B. Within each subtable, the rows represent successive steps in models where individual adversities were entered according to the criterion that they reduced the initial OR for parental divorce by the largest amount. For example, the first subtable for depression shows that adding conflict in the household to the model reduced the OR for parental divorce from 1.59 to 1.17, which was then non-significant. Household conflict thereby accounted for 71 per cent of the original association between parental divorce and adult depression, utilising the formula for percentage change in the log of ORs. Adding further variables into the model further reduced the odds ratio for parental divorce by small amounts.

By way of contrast, the stepwise model for having a first child before age 20 only reduced the association with parental divorce by 34 per cent after the inclusion of all four adversities that were independently related to age of having first child. The odds ratio decreased from 2.88 to 2.24 over the four steps (adding father's drink/drug problems, witnessing abuse of others, mother's drink/drug problems, and receiving too much physical punishment) but remained statistically significant in the final model. In other words, 66 per cent of the original observed association between parental divorce and having a first child before age 20 could not be accounted for by the other childhood adversities measured in this study.

In a small number of instances across the models described in Table B2, the addition of an adversity factor led to a slight decrease in the percentage explained of the OR for parental divorce. This arises when a factor is associated with a **lower** risk of an outcome in a multiple regression model, even though it is linked to an increased risk in a simple bivariate relationship. Such findings are uncommon, usually of little consequence and are, most probably, a form of Type 1 error. However, this occurred in four models for the addition of father's depression. It is not clear why this specific factor should be associated with a small protective effect when modelled in conjunction with other adversities. It does, however, account for (in a statistical sense) the relative prominence of father's depression in Table 8 and its relative unimportance in the stepwise models shown in Table B2.

As well as the importance of the order in which adversities appeared in each analysis of individual outcomes, the pattern of findings across these many analyses (Table B2) was also informative. Household conflict was implicated in the analysis of suicidal thoughts as well as depression, accounting for their association with parental divorce. This was an expected combination given the evident link between these two outcomes. Conflict was also an important explanatory factor in the association of parental divorce with marijuana use. Mother's depression similarly featured in the models predicting depression and suicidal ideation, along with the analysis of anxiety in the 60 to 64 years age group. For outcomes representing transitions to adult roles, both father's and mother's drink/drug problems and witnessing abuse in the family appear frequently in the stepwise models. Father's and mother's drink/drug problems also featured in several other models and so seemed relevant to a diverse set of outcomes. With the notable exceptions of those outcomes where family conflict played a role, a prominent feature of the overall pattern of results was that a combination of several adversity factors was required to account for any substantial component of the associations between parental divorce and poor outcomes.

Table 8: Significant independent predictors of adult outcomes in multiple logistic regression

	Depression	Suicidal thoughts	Anxiety	Secondary education	Hazardous/harmful alcohol use	Current smoking	Ever used marijuana	Age first sex	Age left home	Age lived with partner	Age first child	Currently unmarried	Ever separated	Currently separated	Separated last 6 months
Parental divorce				Yes		Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Father not affectionate	Yes					Yes								Yes	
Mother not affectionate					Yes					Yes			Yes		
Father drank				Yes	Yes	Yes		Yes		Yes	Yes				Yes
Mother drank				Yes	Yes	Yes	Yes	Yes		Yes	Yes				
Father's depression	Yes		Yes	Yes	Yes	Yes			Yes						
Mother's depression	Yes	Yes	Yes		Yes	Yes	Yes			Yes			Yes		
Poverty				Yes			Yes		Yes	Yes					
Too much physical punishment	Yes			Yes			Yes	Yes			Yes				
Household conflict	Yes	Yes					Yes					Yes			Yes
Strict		Yes					Yes	Yes							
Neglect		Yes							Yes						
Humiliation		Yes							Yes				Yes		
Verbal abuse															
Witnessed abuse								Yes		Yes	Yes				
Physical abuse															
Sexual abuse													Yes		

4 Discussion and implications for policy and future research

4.1 Overview of findings

The broad pattern of findings from this study can be summarised as follows.

1. Adults from divorced families of origin were more likely to report a wide range of adverse outcomes than their peers from intact families of origin. For most of these outcomes the odds were 1.4 to 2.4 times greater.
2. Although significant two-way interactions were found between parental divorce and age cohort for two outcomes (anxiety and leaving home before 17 years of age), there was no systematic variation in risk across the three age groups studied. The disadvantages associated with parental divorce for the 20 to 24 years age group (born in the late 1970s) were comparable to those seen for the 60 to 64 years age group (born in the late 1930s and early 1940s).
3. The strongest associations across outcome measures were seen for transitions to adult roles. Those from divorced families were more likely to have had sexual intercourse before age 16, to leave the parental home before age 17, to live with a partner before age 20, and to have their first child when still a teenager. The odds for these outcomes were more than doubled and the ratio almost reached threefold for having a child before age 20.
4. When other forms of childhood adversity were taken into account, the residual associations between parental divorce and adult outcomes were substantially reduced, sometimes to non-significant levels. In these complex models, the only outcomes where odds ratios remained above 1.5 were for early transitions to adult roles and for own subsequent relationship history.
5. The childhood adversities that contributed the most to accounting for differences between people from divorced and intact families of origin were household conflict, father's and mother's drink/drug problems, and mother's depression.
6. Aside of those instances where family conflict made a major contribution to the explanation of poor outcomes for people from divorced families (seen for depression, suicidal ideation and marijuana use), a combination of several adversity factors was necessary to account for any substantial component of the associations between parental divorce and poor outcomes.

4.2 Placing the present findings in the context of previous research

It is important to consider whether any of the main findings of this study are consistent with the existing literature, especially Australian research, as there is a possibility of some results arising by chance (for example, Type 1 error) or from peculiarities of the sample or measures used. Given that the present sample was recruited from a specific region around Canberra, and may not be nationally representative, it is important to note that the rates of parental separation reported by age groups were close to what would be expected for Australia as a whole; certainly for the two younger cohorts. The figures of 12.0 per cent and 21.5 per cent for 40 to 44 year olds and 20 to 24 year olds respectively can be compared with estimates made by de Vaus and Gray (2004) from the Household, Income and Labour Dynamics in Australia (HILDA) study, where 9.5 per cent of children born to couples in 1956–62 experienced parental separation by age 15, as did 22.8 per cent of those

born in 1976–80. The closest estimates from the ABS Family Characteristics and Transitions Survey were about 13 per cent for those born 1952–62 and 24 per cent for those born 1972–82 for experience of parental divorce or permanent separation before the age of 18 years (ABS 2010). It is less easy to validate the reports for the 60 to 64 year olds in the PATH study. The ABS survey gives around 7.5 per cent for parental divorce for those born 1932–42 (ABS 2010). Evans and Kelley (2004) present figures for parental divorce by age 14 of 5 per cent for cohorts born in 1930–39 and 6 per cent for those born 1940–49 using pooled samples from the Australian data collections for the International Social Science Surveys (IcssA) between 1984 and 2002. This is well below the 10.1 per cent reported here (for parental divorce by age 16) in the oldest PATH cohort born during that period. However, the IcssA figure of 5 per cent for a more recent cohort born in 1950–59 (Evans & Kelley 2004) is also less than the proportions reported here, or by de Vaus and Gray (2004) from HILDA, or as indicated by the ABS survey, indicating that it is probably the IcssA estimate that is out of step. There are no other estimates with which to compare the cumulative risk of parental divorce for cohorts born at this time. It is possible that the proportion of the PATH 60 to 64 year olds reporting parental divorce is a little higher than the national average.

The strength of association (that is, effect sizes) found between parental divorce and the range of outcome measures is also consistent with existing research findings, both internationally (Pryor & Rodgers 2001; Rodgers & Pryor 1998) and specifically for Australian studies (Rodgers 1996b) with most odds ratios falling in the range 1.5 to 2.5. However, the spread across measures appears wider than indicated by pooled results from previous studies (Pryor & Rodgers 2001). This may reflect, in part, the inevitable reduction of standard errors of estimates when these are obtained from pooling several studies. However, the larger ORs found for the measures in the domain of transitions to adult roles is reflected in research from other countries. Some typical previous results for rates of teenage births in women include: 34.0 per cent in those from divorced families compared with 10.9 per cent in those from intact homes for women born in Aberdeen (Scotland) from 1910–36 (Illsley & Thompson 1961); 25 per cent compared with 12 per cent for women in the UK National Survey of Sexual Attitudes and Lifestyle born 1931–65 (Kiernan & Hobcraft 1997); and 27 per cent compared with 11 per cent for young women in the US National Longitudinal Survey of Youth born 1962–65 (McLanahan & Sandefur 1994). The present findings therefore reinforce an existing pattern that differences between those from divorced and intact families are especially prominent in the domain of transitions to adult roles.

At the other end of the range of ORs, hazardous alcohol consumption showed a non-significant association with parental divorce. This finding would not have been surprising for adolescents or young adults, as null findings have been common for Australian and overseas studies in relation to alcohol consumption (Bell & Champion 1979; E Staugh & Power 1991; Sweeting, West & Richards 1998; Tennant, Detels & Clark 1975). However, parental divorce has been linked to heavy and problematic alcohol use in several studies of older adults (Kessler, Davis & Kendler 1997; Koller & Castanos 1969; Koller & Williams 1974; Kuh & Maclean 1990) and one longitudinal study has demonstrated an increasing strength of association with age in early adulthood for parental divorce and heavy use (Hope, Power & Rodgers 1998). It would seem hasty to suggest that such an association with heavy alcohol use in older adults is not found in Australia, solely on the basis of the present findings, and this would require additional research evidence.

Although the present study reported significant two-way interaction terms between parental divorce and age group for two outcomes (anxiety and leaving home before age 17), the overall findings taken together did not show an obvious pattern across the age cohorts. There is little existing evidence on this topic. Early meta-analyses suggested the possibility that effect sizes associated with parental divorce had diminished over time (Amato & Keith 1991a, 1991b), but the only studies to test such a trend directly either failed to show any change over a 24-year period (Ely et al. 1999) or concluded that divorce ‘has become more damaging in recent cohorts’ (Evans, Kelley & Wanner 2009). On closer inspection, however, the latter study’s findings show that the ‘ballooning’ of educational disadvantage experienced by children of divorced families across Australia, Canada and the US largely took place between cohorts born before 1929 and those born in 1930–39 (particularly in Australia), which predates the historical period represented by the three PATH cohorts. Updated meta-analyses by Amato (2001) suggested that effect sizes associated with parental divorce are curvilinear over time and reached their minimum points (depending on the outcome measure) in studies published

between the mid-1970s (for psychological adjustment) and the late 1980s (for academic achievement). Unfortunately, publication years can be several years after data were collected and, importantly, neither date is clearly linked to year of birth, so it is impossible to comment on how these indicated patterns might relate to the findings from the PATH cohorts born around the late 1930s, 1950s and 1970s. What factors might lie behind such temporal trends (assuming they exist) are yet to be identified.

There is a paucity of previous research attempting to account for associations of parental divorce with adult family, social and psychological outcomes by reference to other forms of childhood adversity. It is difficult, therefore, to consider whether the present findings are as might be expected or otherwise. The one area where there has been a significant research effort is the work of McLanahan and Sandefur (1994), specifically their conclusion that half of the educational disadvantage found in children in lone-parent families is attributable to financial hardship. The item on growing up in poverty in the present study only contributed 9 per cent to accounting for the association between parental divorce and the completion of secondary education. This could reflect the limitations of a retrospective question as against the contemporary information on financial circumstances in the several US data sets investigated by McLanahan and Sandefur (1994). If so, this limitation may generalise to models for other outcomes in the PATH study, although it is not likely to affect all these analyses as the associations between early financial hardship and several outcomes are known to be weak even when investigated prospectively; for example, for depression and anxiety in adulthood (Rodgers 1990). Alternative explanations are that the role of financial hardship has been previously overestimated and/or that it is more relevant to the US than to Australia. One indication that the former may be true is that educational disadvantage is typically just as evident in children living in stepfamilies (Evans, Kelley & Wanner 2001; Pryor & Rodgers 2001) as it is in the lone-parent families studied by McLanahan and Sandefur (1994), yet financial hardship is far less common in the former. The cautious approach for the present would be to accept that the role of poverty may be underestimated in the present study, particularly for those outcomes where a relationship was found (Table B2) or where one might be expected. Australian studies with contemporaneously collected data on financial circumstances would help to resolve this issue.

Aside of the role of financial hardship, there is little by way of existing hard evidence with which to compare the findings summarised in points (4) to (6) above. However, there have been a number of studies examining the role of parental conflict in conjunction with parental separation as influences on the welfare of children and adolescents. The findings of these previous studies are mixed and no consistent pattern has emerged (Amato 1993; Hanson 1999; Jekielek 1998; Mechanic & Hansell 1989). The present study adds to this literature by indicating that household conflict made a very strong contribution to certain poor outcomes for those from divorced families of origin, but only for three of the many outcomes studied. Such specificity in the role of particular adversities to account for differences in particular outcomes was unusual in the analyses (Table B2). This suggests that the diversity in the existing literature may reflect variety in the outcomes selected for assessment in different studies as well as acknowledged issues surrounding the problematic measurement of conflict (Pryor & Rodgers 2001). Our findings were consistent with the interpretation of Evans, Kelley and Headey (2001), based on *IsssA* data, that marital conflict probably did not contribute to the poorer educational attainment of children from divorced families. However, conflict did make a strong contribution to their levels of depression, suicidal ideation and marijuana use.

An unexpected finding from the present study was that parental divorce remained as a significant predictor of many poor outcomes after adjustment for other adversity factors and that these residual (or direct) associations were especially strong for outcomes in the domain of transitions to adult roles and for own relationship history throughout adulthood. In addition to these outcomes, substantial and significant associations remained for completion of secondary education and for smoking in the complex models. This could indicate that family separation itself has harmful long-term effects for children's wellbeing in these domains or it could reflect the omission of other important adversities from the PATH data collection. The latter could arise because there is a less informative literature on early predictors of some adult outcomes than there is for mental health and that the adversity items were more relevant to the latter. Nevertheless, the relatively large bivariate effect sizes for family and intimate relationships observed across many studies of parental divorce (Pryor & Rodgers 2001) as well as the present study, coupled with our findings from the

complex models, further points to some specificity in this intergenerational link. Again, future research with contemporaneous and prospective information is likely to be useful and transitions to adult roles, at least, are amenable to longitudinal investigation within a medium time frame.

4.3 Implications for policy and practice

The implications of findings for policy and practice will be discussed in regard to three main areas. The first is the strength of associations between parental divorce and the range of adult family, social and psychological outcomes assessed in this study. The second is the type of adversity factors identified as contributing most to poorer outcomes for those from divorced families of origin. The third is the similarity between adversities that contribute most to poor outcomes in those from divorced families of origin and those adversities that are important irrespective of family type.

The first and most obvious implication of these findings for policy and practice is that they reinforce existing international research evidence on adult outcomes associated with parental divorce (Amato & Keith 1991a; Pryor & Rodgers 2001; Rodgers & Pryor 1998), demonstrating that the strength of association is similar in the Australian population as observed in other developed countries (Rodgers 1996b). Hopefully, suggestions that the Australian context is somehow unique in preventing poor long-term outcomes after family separation can be finally dismissed (Dunlop 1993; Glover 1993a, 1993b, 1993c; Jones 1993; Legge 1993; Simons 1993).

It is worthwhile reflecting on the costs of such outcomes, not just to the individuals concerned, but to society more broadly. This can be illustrated using the example of adult depression (which along with current smoking represented the median strength of association before adjustment for other adversities, as seen in Figure 1) where current high depression levels were reported by 9.0 per cent of those from divorced families compared with 6.0 per cent of those from intact families. These figures, along with a present estimate that around one in four children experience divorce or permanent separation of their parents by age 16 years, can be used to calculate the potential benefit of interventions aimed at eliminating this difference. This calculation, based on the epidemiological tool of population attributable risk (PAR), determines the reduction in depression across the whole population if it were possible to bring down the prevalence in those from divorced families to 6 per cent (that is, the same as for those from intact families). Using the present figures, the PAR% is found to be 11.1 per cent and that figure can be applied to estimate the potential reduction on demand on mental health services and other community costs of depressive disorders, if successful intervention were achieved. One advantage from using the calculation of PAR is that it reflects not just the effect size (for example, OR) linking parental divorce with adult depression, but that it also takes account of the probability of parental separation. PAR increases with the increase in this proportion (as divorce has become more common across generations) even when the effect size associated with an outcome shows no change over time.

The second implication for policy and practice arises from the demonstration that other childhood adversities make substantial contributions to the long-term disadvantages associated with parental divorce. It is an important message for service providers and for families themselves that such disadvantages are not inevitable consequences of family separation itself, as this presents the opportunity for intervention and amelioration. Further, the identification of the specific adversities implicated across the many models (Table B2) can indicate both the types of families that are at most risk—and therefore can be targeted for more intensive preventative strategies—and what forms of intervention may have the greatest potential benefits. The analyses particularly identified family conflict, mother's and father's drink/drug use and mother's depression as the other adversities contributing most to disadvantages in those from divorced families of origin.

Within the current Australian family law system, including services provided through the FRSP and other sources of funding, family conflict in the context of divorce has a relatively high profile because of its impact on the wellbeing of children (McIntosh 2003). This is reflected in both specific programs to help reduce conflict in individual families and in a broader strategy to minimise adversarial processes around family separation. This emphasis appears to be further justified in regard to the potential long-term consequences indicated by

our analyses for adult mental health (depression and suicidal ideation) and for marijuana use. That said, there were many other long-term outcomes for which family conflict made a minimal contribution to the differences between those from divorced and intact families. Further, the other relevant adversities of parental substance use and parental depression are relatively neglected within the Australian family law system (Rodgers, Smyth & Robinson 2004), whether due to a failure to recognise these as important problems or due to a lack of capacity within existing services to deal with them. Service providers themselves acknowledge the widespread prevalence of such problems in the families they deal with and this raises important issues as to how such problems can be addressed effectively within this service sector. These issues have achieved greater prominence in other countries (Coleman & Glenn 2010) and it is encouraging that they have been explicitly acknowledged in the funding provided recently to Family Pathways Networks around Australia.

Of course, there are other types of services and other preventative strategies that deal with substance use and mental health problems and they inevitably include parents, some of whom have experienced or will experience marital breakdown. In general, these tend to focus on the individual requiring treatment, although some forms of therapy may involve families to a degree and, exceptionally, may use family dynamics as a basis for intervention. It is comparatively rare for such services to consider the wellbeing of children as a primary concern and, when this occurs, it tends to be in circumstances where parents have very severe disorders (AICAFMHA 2004) rather than the common problems covered by the PATH items on parental depression and drink/drug use (Table 1). One would hope that existing services could at least be alerted to the possible consequences of such common problems for children's wellbeing and could make appropriate referrals to other sectors where necessary. In regard to health promotion messages, especially in the light of the generally low rate of uptake of treatment for adult mental health and substance use problems (Andrews et al. 2000), our findings suggest that the possibility of long-term harm to children could be incorporated into messages encouraging parents to utilise appropriate services and into arguments for governments to fund such services.

The third area in which the findings have implications for policy and practice relates to the similarity between the adversities identified as contributing to poor outcomes for those from separated families and those factors that are important for children's long-term wellbeing irrespective of family type. A comparison between the stage 2 analyses (summarised in Table 8) and the stage 3 findings (detailed in Table B2) provides a convenient way to consider this issue. Substantial overlap was found across these analyses (except for the already discussed prominence of family conflict in a small number of stage 3 models). In essence, the factors of importance to children's long-term outcomes following parental divorce are largely the same as those affecting all children. This is not a radical observation but it does support a broad overview that the goals that feature in initiatives designed for families in transition (for example, some of the FRSP subprograms) will and should overlap and be complementary to the goals of more general initiatives, such as those seen within the former Stronger Families and Communities Strategy.

4.4 Limitations

The most evident limitation of this study was its reliance on retrospective reports of childhood family adversity. Contemporaneous reports may provide more reliable and valid measures of some of these adversities. However, it should be noted that such measures may have problems of their own (for example, assessments of abusive parenting are not likely to be feasible or ethical) and they are typically derived from a parent's perspective rather than from a child's experience. It is inevitable, too, that prospective designs would require considerable delays in following up participants to assess their adult outcomes, and that other threats to validity come into play in these circumstances, including sample attrition and selective loss to follow up. The retrospective design of the present study is, therefore, more appropriately viewed as a complementary approach to prospective studies rather than as a second-best method.

It is also important to keep in mind that the analyses reported here could not disaggregate the experience of adversity before the time of parental divorce from experiences after (and possibly as a consequence) of divorce as no data were collected on the relative timing of experiences in the PATH study. Collecting such information

would be difficult in any retrospective study. However, it is an expectation that the knowledge gained from these analyses will help identify and refine measures for use in prospective longitudinal research and that such studies would be better placed to address more complex models of temporal order and causal mechanisms. They would, of course, be able to consider other outcomes specifically relevant to the childhood years and there is no necessity that influential factors in the short term are the same as those contributing to long-term (including adult) outcomes.

Similarly, the PATH data set does not include information on multiple family transitions and, again, this would be better achieved through prospective methods. From other studies, it is known that the majority of children experience either one or two transitions (typically separation of their original parents followed, possibly, by repartnering). However, as already pointed out, reviews show no difference in long-term outcomes for children from lone-parent families and those from stepfamilies (Amato 1993; Pryor & Rodgers 2001). It is the number of separations or changes in partner, rather than new partners, that appears relevant to children's outcomes (Hayatbakhsh, Najman, Jamrozik, Mamun, Williams & Alati 2006). Nevertheless, it is possible that the adversities implicated in families that experience multiple separations may be different from those that experience just one separation.

The present study was also based on a regional sample and, particularly from an area known to be of high socioeconomic status relative to the whole of Australia. This would inevitably influence the absolute probability of some outcomes (although mental health problems and substance use are similar in the ACT compared with the rest of Australia) but it may have little implication for the strength of association with parental divorce. Effect sizes associated with parental divorce across English-speaking and other developed countries seem remarkably robust across time, place and social status (Pryor & Rodgers 2001). The proportions of participants reporting parental divorce also appeared close to what would be expected for Australians born around those times, although this was difficult to verify for the group aged 60 to 64 years. This group was the most problematic in terms of the study design in that most participants would not have been born in the area from which they were recruited for the study. Surprisingly, perhaps, little has been reported on how parental divorce is linked to migration, so it is difficult to say whether this may be a source of bias in the PATH sample.

Finally, the analyses reported in Table B2 could well produce different findings in different samples, particularly in regard to the order of entry of the significant adversity factors. In several of these stepwise models, the order of entry was determined by relatively small differences in the strength of contribution of the competing adversity factors. However, this order of entry does not affect the results reported from stages 1 and 2 of the analyses. For stage 3 of the analyses, the relative importance of other adversity factors in accounting for the poorer outcomes of children from divorced families is best indicated by the overall pattern of findings in Table B2, rather than by the precise order of entry for any single outcome.

4.5 Implications for future research

The implications of these findings for future prospective studies of children have been mentioned above. It is self-evident that such studies would wish to cover as much as possible of the important adversity factors identified in Tables 8 and B2. It is also reassuring that some of the adversities that are most problematic to assess contemporaneously did not feature strongly in the stage 2 and stage 3 analyses (neglect, humiliation and witnessing abuse of others were the notable exceptions).

The strength and specificity of associations between parental divorce and transitions to adult roles suggest a need to focus further research on such outcomes. First, it would be important to try to gain a better understanding of what factors (if any), other than family separation itself, lead to these early transitions. Second, whatever the underlying dynamics behind these transitions are, it would be important to establish the consequences of such early entry into adult roles. These may be benign for young people but could also be far-reaching and long-lasting. Early partnering and having children at a young age are, in turn, linked to relationship breakdown and so can eventuate in the intergenerational transmission of divorce (Amato 1996;

Kiernan & Cherlin 1999). However, incorporating early transitions to adult roles into the analyses predicting later relationship history only accounted for a small part of the very long-term associations between parental divorce and own divorce (Figures 7 and 8), so additional factors are likely to contribute to this connection. Following an adult life track at an early age may also curtail further education and receipt of qualifications, with possible long-term ramifications for socioeconomic status. Better understanding is needed as to whether late childhood and early adulthood constitutes a particularly vulnerable period for those from divorced families.

A final and specific product of the present research project was to inform the choice of measures for the second wave of data collection in the Longitudinal Study of Australian Children (LSAC). Information has been collected in Wave 2 on the families of origin of the parents of the study children. Our analyses provided an empirical basis for selecting measures of childhood adversity that are most strongly related to adult outcomes. The six items selected as the most appropriate for the study, taking account of the pressure on questionnaire space, were parental divorce, family conflict, father's and mother's drink/drug problems, and father's and mother's depression.

Appendix A: Questionnaire items from the PATH Through Life Project

Childhood adversity

The next questions are about your childhood, *up to the age of 16 years*.

How affectionate was your father (or father figure) towards you?

- ☐ A lot
- ☐ Somewhat
- ☐ A little
- ☐ Not at all
- ☐ No father figure

Did your father (or father figure) suffer from nervous or emotional trouble or depression?

- ☐ Yes ☐ No

Did your father (or father figure) have trouble with drinking or other drug use?

- ☐ Yes ☐ No

How affectionate was your mother (or mother figure) towards you?

- ☐ A lot
- ☐ Somewhat
- ☐ A little
- ☐ Not at all
- ☐ No mother figure

Did your mother (or mother figure) suffer from nervous or emotional trouble or depression?

- ☐ Yes ☐ No

Did your mother (or mother figure) have trouble with drinking or other drug use?

- ☐ Yes ☐ No

How much conflict and tension was there in your household while you were growing up?

- ☐ A lot ☐ Some ☐ A little ☐ None

Did your parents divorce or permanently separate when you were a child?

- ☐ Yes ☐ No

Which of the following applied to your childhood? *(When we say 'parent' we mean 'parent or parent figure'.)*

- ☐ I had a happy childhood
- ☐ My parents did their best for me
- ☐ I was neglected
- ☐ I had a strict, authoritarian or regimented upbringing
- ☐ I grew up in poverty or financial hardship
- ☐ I was verbally abused by a parent
 - ☐ I suffered humiliation, ridicule, bullying or mental cruelty from a parent
- ☐ I witnessed physical or sexual abuse of others in my family
 - ☐ I was physically abused by a parent—punched, kicked, hit or beaten with an object, or needed medical treatment
 - ☐ I received too much physical punishment—hitting, smacking etc.
- ☐ I was sexually abused by a parent
- ☐ Other type of mistreatment
- ☐ I had a normal upbringing

In what other way were you mistreated by your parents?

Outcomes

Life transitions

How old were you when you first lived away from your parents or parent figure? *(Enter 99 if not applicable.)*

_____ years old

How old were you the first time you had sexual intercourse? *(Enter 99 if not applicable.)*

_____ years old

How old were you when you first lived with a partner? *(Enter 99 if not applicable.)*

_____ years old

How old were you when your first child was born?

_____ years old

Education

What is the highest level of schooling you have completed?

- ☐ Some primary
- ☐ All of primary
- ☐ Some of secondary
 - ☐ Three/four years of secondary (intermediate, school certificate level)
 - ☐ Five/six years of secondary (leaving, higher school certificate)

What is the highest level of post secondary/tertiary education you have completed?

- ☐ Trade certificate/apprenticeship
- ☐ Technician's certificate/advanced certificate
- ☐ Certificate other than above
- ☐ Associate diploma
- ☐ Undergraduate diploma
- ☐ Bachelor's degree
- ☐ Post graduate diploma/certificate
- ☐ Higher degree
- ☐ None of the above

Are you presently studying for any of the following?

- ☐ Trade certificate/apprenticeship
- ☐ Technician's certificate/advanced certificate
- ☐ Certificate other than above
- ☐ Associate diploma
- ☐ Undergraduate diploma
- ☐ Bachelor's degree
- ☐ Post graduate diploma/certificate
- ☐ Higher degree
- ☐ None of the above

How long does that certificate or diploma take to complete, studying full time?

- ☐ Less than 1 semester or 1/2 year
- ☐ One semester to less than 1 year
- ☐ One year to less than 3 years
- ☐ Three years or more

Are you studying?

- ☐ Full-time
- ☐ Part-time

Marital status

Are you currently in a relationship with someone?

- ☐ Yes, living with the person you are married to
- ☐ Yes, living with a partner (but not married to them)
- ☐ Yes, in a relationship with someone but not living with them
- ☐ No, not in a relationship with anyone

What is your current marital status?

- ☐ Married—first and only marriage
- ☐ Remarried—second or later marriage
- ☐ Separated from someone you have been married to
- ☐ Divorced
- ☐ Widowed
- ☐ Have never married

How many times have you been married or lived in a de facto relationship? Also, only include past relationships that lasted for 6 months or more.

Now we would like you to focus on the *last 6 months*. Have any of the following life events or problems happened to you during the last six months?

You broke off a steady relationship ☐ Yes ☐ No

Substance use

How often do you have a drink containing alcohol?

- ☐ Never
- ☐ Not in the last year
- ☐ Monthly or less
- ☐ 2 to 4 times a month
- ☐ 2 to 3 times a week
- ☐ 4 or more times a week

How many standard drinks do you have on a typical day when you are drinking?

Ask 'interviewer' for Showcard A which explains what we mean by 'a standard drink'.

- ☐ 1 or 2
- ☐ 3 or 4
- ☐ 5 or 6
- ☐ 7 to 9
- ☐ 10 or more

How often do you have 6 or more standard drinks on one occasion?

- ☐ Never
- ☐ Less than monthly
- ☐ Monthly
- ☐ Weekly
- ☐ Daily or almost daily

Do you currently smoke? ☐ Yes ☐ No

Have you ever tried marijuana/hash? ☐ Yes ☐ No

Goldberg Depression and Anxiety Scales

Have you felt keyed up or on edge? ☐ Yes ☐ No

Have you been worrying a lot? ☐ Yes ☐ No

Have you been irritable? ☐ Yes ☐ No

Have you had difficulty relaxing? ☐ Yes ☐ No

Have you been sleeping poorly? ☐ Yes ☐ No

Have you had headaches or neckaches? ☐ Yes ☐ No

Have you had any of the following: trembling, tingling, dizzy spells, sweating, diarrhoea or needing to pass water more often than usual? ☐ Yes ☐ No

Have you been worried about your health? ☐ Yes ☐ No

Have you had difficulty falling asleep? ☐ Yes ☐ No

Have you been lacking energy? ☐ Yes ☐ No

Have you lost interest in things? ☐ Yes ☐ No

Have you lost confidence in yourself? ☐ Yes ☐ No

Have you felt hopeless? ☐ Yes ☐ No

Have you had difficulty concentrating? ☐ Yes ☐ No

Have you lost weight (due to poor appetite)? ☐ Yes ☐ No

Have you been waking early? ☐ Yes ☐ No

Have you felt slowed up? ☐ Yes ☐ No

Have you tended to feel worse in the mornings? ☐ Yes ☐ No

Suicidality

In the *LAST YEAR* have you ever:

Felt that life is hardly worth living?	☐ Yes	☐ No
Thought that you really would be better off dead?	☐ Yes	☐ No
Thought about taking your own life?	☐ Yes	☐ No

If Q317=1, go to Q318.

In the *LAST YEAR* have you ever:

Made plans to take your own life?	☐ Yes	☐ No
Attempted to take your own life?	☐ Yes	☐ No

Appendix B: Supplementary tables

Table B1: Odds ratios and their confidence intervals across outcomes: simple and complex models

Variable	Simple model (95% CI)	Complex model (95% CI)
Depression	1.59 (1.28–1.99)	1.09 (0.86–1.39)
Suicide	1.42 (1.19–1.70)	0.97 (0.80–1.18)
Secondary education	1.70 (1.45–1.99)	1.47 (1.25–1.73)
Hazardous/harmful alcohol use	1.21 (0.94–1.57)	1.06 (0.82–1.39)
Currently smoking	1.62 (1.40–1.89)	1.42 (1.22–1.66)
Ever used marijuana	1.46 (1.25–1.71)	1.21 (1.03–1.42)
Age first sexual intercourse	2.35 (1.94–2.85)	1.93 (1.58–2.36)
Age lived with partner	2.40 (2.04–2.83)	1.96 (1.65–2.33)
Age first child born	2.88 (2.24–3.72)	2.24 (1.71–2.93)
Anxiety (60–64 years group only)	3.14 (1.92–5.13)	2.80 (1.70–4.62)
Odds ratios below are for the 40 to 44 years and 60 to 64 years age groups only		
Age left home	2.18 (1.79–2.66)	1.93 (1.57–2.38)
Currently unmarried	1.52 (1.24–1.86)	1.39 (1.13–1.72)
Ever had children	0.93 (0.70–1.24)	0.93 (0.70–1.24)
Currently separated	1.75 (1.38–2.21)	1.63 (1.28–2.06)
Ever separated	1.73 (1.45–2.08)	1.58 (1.32–1.91)
Relationship ended in last 6 months	1.77 (1.09–2.87)	1.54 (0.94–2.53)

Table B2: Stepwise models showing specific childhood adversities that contribute to differences in outcomes between those from divorced and intact families of origin

(a) Models applicable across age cohorts

Depression

Variable added	OR for parental divorce	Percentage explained
Simple model	1.59	
Household conflict	1.17 ^(a)	71%
Mother had depression	1.11	81%
Father not affectionate	1.09	85%
Physical punishment	1.09	85%
Father had depression	1.09	85%

(a) At this point, parental divorce becomes non-significant in the model.

Suicidal thoughts

Variable added	OR for parental divorce	Percentage explained
Simple model	1.42	
Household conflict	1.07 ^(a)	83%
Mother had depression	1.00	100%
Neglect	0.97	107%
Humiliation	0.97	107%
Strict	0.97	107%

(a) At this point, parental divorce becomes non-significant in the model.

Secondary education

Variable added	OR for parental divorce	Percentage explained
Simple model	1.70	
Father had drinking/drug problems	1.59	16%
Poverty	1.51	27%
Mother had drinking/drug problem	1.48	31%
Physical punishment	1.46	34%
Father had depression	1.47	33%

Smoking now

Variable added	OR for parental divorce	Percentage explained
Simple model	1.62	
Father had drinking/drug problem	1.53	11%
Mother had drinking/drug problem	1.46	26%
Mother had depression	1.43	31%
Father not affectionate	1.41	34%
Father had depression	1.42	32%

Ever used marijuana

Variable added	OR for parental divorce	Percentage explained
Simple model	1.46	
Household conflict	1.25	46%
Mother had drinking/drug problem	1.21	54%
Mother had depression	1.19	59%
Physical punishment	1.19	59%
Strict	1.18	61%
Poverty	1.21	54%

Age at first sexual intercourse

Variable added	OR for parental divorce	Percentage explained
Simple model	2.35	
Father had drinking/drug problem	2.19	12%
Mother had drinking/drug problem	2.08	20%
Neglect	2.00	26%
Witness abuse	1.95	30%
Physical punishment	1.93	31%

Age first lived with partner

Variable added	OR for parental divorce	Percentage explained
Simple model	2.40	
Father had drinking/drug problem	2.24	11%
Poverty	2.13	19%
Mother had drinking/drug problem	2.05	25%
Witness abuse	1.99	29%
Mother had depression	1.97	31%
Mother not affectionate	1.96	31%

Age when first child born

Variable added	OR for parental divorce	Percentage explained
Simple model	2.88	
Father had drinking/drug problems	2.54	18%
Witnessed abuse	2.40	25%
Mother had drinking/drug problems	2.30	31%
Physical punishment	2.24	34%

(b) Models for particular age groups

Anxiety: Age group: 60 to 64 years

Variable added	OR for parental divorce	Percentage explained
Simple model	3.14	
Mother had depression	2.77	17%
Father had depression	2.80	16%

Age left parent home: 40 to 44 years and 60 to 64 years age groups only

Variable added	OR for parental divorce	Percentage explained
Simple model	2.18	
Neglect	2.01	14%
Poverty	1.92	22%
Humiliation	1.88	25%
Father had depression	1.88	25%

Currently unmarried: 40 to 44 years and 60 to 64 years age groups only

Variable added	OR for parental divorce	Percentage explained
Simple model	1.52	
Household conflict	1.39	25%

Currently separated: 40 to 44 years and 60 to 64 years age groups only

Variable added	OR for parental divorce	Percentage explained
Simple model	1.75	
Mistreat	1.67	11%
Father not affectionate	1.63	16%

Ever been separated: 40 to 44 years and 60 to 64 years age groups only

Variable added	OR for parental divorce	Percentage explained
Simple model	1.73	
Humiliation	1.64	12%
Mother had depression	1.61	16%
Mistreat	1.59	19%
Mother not affectionate	1.58	20%
Sexual abuse	1.58	20%

Relationship ended in last 6 months: 40 to 44 years and 60 to 64 years age groups only

Variable added	OR for parental divorce	Percentage explained
Simple model	1.77	
Father had drinking/drug problem	1.60 ^(a)	22%
Strict	1.54	30%

(a) At this point, parental divorce becomes non-significant in the model.

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