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# **The impact of family structure during childhood on later-life attainment**

**Marco Francesconi, Stephen P. Jenkins and Thomas Siedler**

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## THE IMPACT OF FAMILY STRUCTURE DURING CHILDHOOD ON LATER-LIFE ATTAINMENT

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The research led to a number of academic papers. These are currently being revised and will be released as ISER and DIW Berlin working papers, downloadable from <http://www.iser.essex.ac.uk/pubs/workpaps/> and <http://www.diw.de/english/sop/soep/pub/dokumente/diskussionspapiere/diw/index.html>.

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## Executive summary

The question addressed by this report is 'How does growing up in a family headed by a lone mother affect the later-life educational achievements, health, employment status and earnings of German children?'.

Why are the answers important? The more that disadvantage is transmitted from parents to children, the less there is equality of opportunity, a principle of social justice with wide support. Also, it is important to ensure that the huge amount of resources invested in children – mostly by parents – is well spent. In addition, our research is relevant to contemporary debates in a number of European countries about the extent to which policies should focus on reducing inequalities of outcome (for example, unemployment, poverty or poor health), or address the root causes of those inequalities – which potentially include inequalities in family background and family structure.

The relevance of studying the effects of family structure is underlined by the large changes in family structure that have occurred over the last three decades in Germany. For example, between 1991 and 2001, the number of lone-parent families rose from 11.5% to 13.6% of all families. To the extent that life in a lone-parent family affects later-life attainments, increasing numbers of children have become at risk of experiencing this disadvantage.

In Germany, young adults who belong to a lone-parent family at some time during their childhood are more likely to have lower educational attainments, to be in poor health and to have less success in the labour market. However, one cannot conclude from these raw associations that family structure has a genuinely causal effect on socioeconomic attainments – the associations may arise simply because family structure and the outcomes are each caused by a third set of factors.

Estimating the true impact of family structure on socioeconomic attainments in Germany was the goal of the research. We used specially constructed datasets from the German Socioeconomic Panel Survey (SOEP), and considered a number of different outcomes for young adults: highest educational qualification (whether had *Abitur* or higher); whether attended a *Gymnasium* (an academically-orientated grammar rather than vocational or general secondary school); whether the individual smoked; whether in poor health; whether registered as unemployed, whether receiving social assistance; and earnings (for those who had a full-time job).

Because assessment of the causal effects of family structure is a tricky business, a combination of statistical methods was used to check whether each pointed to the same conclusion or not. In addition, to control for differences in social and cultural environments, analysis was conducted separately for three samples of young adults – those individuals who grew up in a family from (1) the former West Germany headed by a native German; (2) the former West Germany headed by a guestworker; and (3) the former East Germany headed by a citizen of the former German Democratic Republic (GDR).

Our principal findings about the impact of growing up in a non-intact family during childhood are as follows:

- The probability of achieving *Abitur* or higher educational qualifications appeared to be adversely affected by ever living in a non-intact family during childhood for the individuals belonging to the West German and Guestworker samples, but this finding is sensitive to the statistical method that is used to derive it.
- Living in a non-intact family during childhood had an adverse impact on whether the individual was attending a *Gymnasium* at age 14, although only for members of the West German sample. The effect appears to be due to the occurrence of non-intactness rather than to how long non-intactness lasted.
- Individuals who ever lived in a non-intact family during childhood were more likely to smoke and hence be at greater risk of having poor lifetime health. This was found for members of all three samples, and was robust to choice of statistical method. In contrast, family structure during childhood did not affect whether individuals reported themselves to be in poor health.
- Individuals from the West German sample who experienced life in a non-intact family were more likely to live in a household receiving social assistance. There was no impact on the probability of being unemployed or on the earnings for full-time employees for any of the three samples, however.
- Taking the results all together, whether family structure has a genuinely causal effect on the attainments of young German adults depends on the outcome considered and the statistical method employed.
- Whether family breakdown during childhood had an adverse impact also depended on whether the individual belonged to the West German, Guestworker or German sample. This suggests that 'institutions matter' for outcomes.

We were able to compare our findings about Germany with findings about Britain because we used a research design that intentionally mimicked that used by a British research project (led by Ermisch and Francesconi).

In Britain, growing up in a non-intact family has an adverse effect on the probability of having educational qualifications to university entry level, and on the probability of non-employment, regardless of the statistical method used. By contrast, for West Germany, a statistically significant adverse effect is estimated according to one method but not another. (If one controls for unobserved family background effects by analysing differences among siblings, we cannot reject the hypothesis that there is no effect in West Germany for both outcomes.) On the other hand, for both countries, experience of lone parenthood as a child is associated with a higher probability of being a smoker, regardless of the statistical method used.

The Anglo-German pattern of differences and similarities in results cannot be easily related to common characterisations of the cross-national differences in education systems, labour markets or welfare states. That there is no simplistic welfare state 'regime'-type argument to explain cross-national differences in the impact of childhood family structure on attainments is underlined by the recent research comparing Sweden

and the USA (Björklund et al, 2004). One might expect family structure changes to have a potentially less adverse effect on outcomes in Sweden than in the USA because of the more comprehensive and generous social safety net in Sweden, and because legal marriages and cohabiting partnerships are treated more equally. Yet, Björklund and colleagues found that, once unobserved family background effects were controlled for, there was no family structure effect on either the number of years spent in schooling or on the earnings of young people in either country.

Our findings provide several messages for policy makers. First, they cannot assume that growing up in a lone-parent family has a universally adverse impact on later-life outcomes. To be sure, it is true in Germany – as in Britain and many countries – that individuals who spent time in a lone-parent family during childhood had lower attainments than those who remained with both parents throughout childhood. But this does not mean that the differences in family structure caused the lower attainments. For some outcomes, they do; for others it appears that they may not. They may be caused by other factors that are associated with differences in family structure (many of which are not directly measurable).

Second, and related, this means that policies to reduce the prevalence of lone parenthood such as making divorce harder will not have unambiguously positive or universal effects on later-life attainments (and ‘forcing’ parents to stay together may have other adverse consequences for children).

Third, although our results about the impact of family structure during childhood are not clear-cut, this does not mean that ‘family background’ is not important for determining socioeconomic outcomes. Family background has many dimensions in addition to family structure. Our study has underlined the importance of these, as has much previous research. (In Chapter 4, we draw attention to factors such as maternal educational qualifications, and Chapter 1 also refers to various types of unmeasured background factor.) Put another way, if the goal is to reduce inequalities in later-life attainments, it may be more effective for policy to target educational achievement rather than marriage.

Fourth, if our results provide any comfort for German policy makers, it is that the situation is apparently better than in Britain where the effects of family break-up on later-life attainments are more definitely adverse. However, German policy makers should not be sanguine. Our findings are that there is currently no unambiguous proof that growing up in a lone-parent family has adverse effects for later-life outcomes (with the exception of the effect on smoking). To reiterate: this does not mean that there is no effect. It means that the size and direction of the effect is not known for sure (for important statistical reasons). Indeed, our results are consistent with the effect being adverse.

Fifth, the experiences of different countries provide no simple diagnoses or obvious policy ‘magic bullets’ for reducing the harmful impacts of family break-up. Cross-national patterns are often explained with recourse to broad brush descriptions of differences in welfare state regimes and other socioeconomic and cultural institutions. However, these differences provide no straightforward explanation for differences between different groups within Germany, between Britain and Germany or indeed between Sweden and the USA.

# 1 Introduction

## **Why is family background, and family structure in particular, of interest?**

This report documents how differences in the socioeconomic attainments of young adults in Germany are related to differences in their family background, in particular differences in the family structure that they experienced during childhood. We consider whether growing up in a family headed by a lone mother affects educational achievements, health, employment status and earnings.

The impact on socioeconomic attainment of family background, and family structure in particular, is of interest to parents, governments and society more generally for two main reasons. First, the extent to which advantage or disadvantage is transmitted across generations is often taken as an indicator of inequality of opportunity. The basic idea is that starting positions in the competition of life should be equalised, and hence not related to one's family background. There is an inevitable conflict between this principle and the principle that parents should be at liberty to do the best they can for their children – which, if respected, implies that family background will be associated with outcomes. Our concern in this report is not with advancing the philosophical arguments concerning the two principles or their relative merits, or evaluating their implications for practical policy making. Rather, our goal is more straightforwardly empirical: we provide factual evidence about the nature of the relationship between socioeconomic attainment and family background (and family structure in particular) that might be drawn on by participants in those philosophical debates.

Second, and regardless of concerns about social justice, our topic is of interest because parents, governments and society more generally wish to ensure that the huge amount of resources invested in children is well spent. According to a recent study, expenditures on children in the USA accounted for about one sixth of GDP, of which almost 70% (almost one tenth of US GDP) was spent by parents, including direct expenditures on food, housing, transport, clothing and so on, plus the opportunity costs of time mothers put into caring for their children (Haveman and Wolfe, 1995). The remaining 30% was contributed by government through a range of social programmes such as schooling and other education, social services, health insurance and income support. No parent wishes to see their child do badly at school, to end up unemployed or stuck in a dead-end job, or in poor health, and there is widespread support for social policies directed at improving children's attainments and avoiding disadvantageous outcomes. Evidence about the extent to which growing up in a lone-parent family has deleterious consequences for later-life outcomes is relevant to this.

These observations connect our research with contemporary debates in a number of European countries about the extent to which policies should focus on reducing inequalities of outcome (for example, unemployment, poverty or poor health), or address

the root causes of those inequalities – which potentially include inequalities in family background and family structure.

There is policy concern about intergenerational transmission of disadvantage in both Britain and Germany. For example, in Britain, the Secretary of State for Work and Pensions in the Labour government recently stated that:

'The poverty we inherited in 1997 denied people opportunity, limited potential and stored up economic costs and social problems for the future. Disadvantaged children fell into poverty as adults and then into poverty in retirement. By addressing the causes of poverty as well as addressing the symptoms, we have started to break this vicious cycle.' (DWP, 2004: 1)

In Germany, increasing the resources invested in children (especially through education), and countering inequalities of opportunity have been specifically cited as policy goals by *Bundeskanzler* Gerhard Schröder (2002):

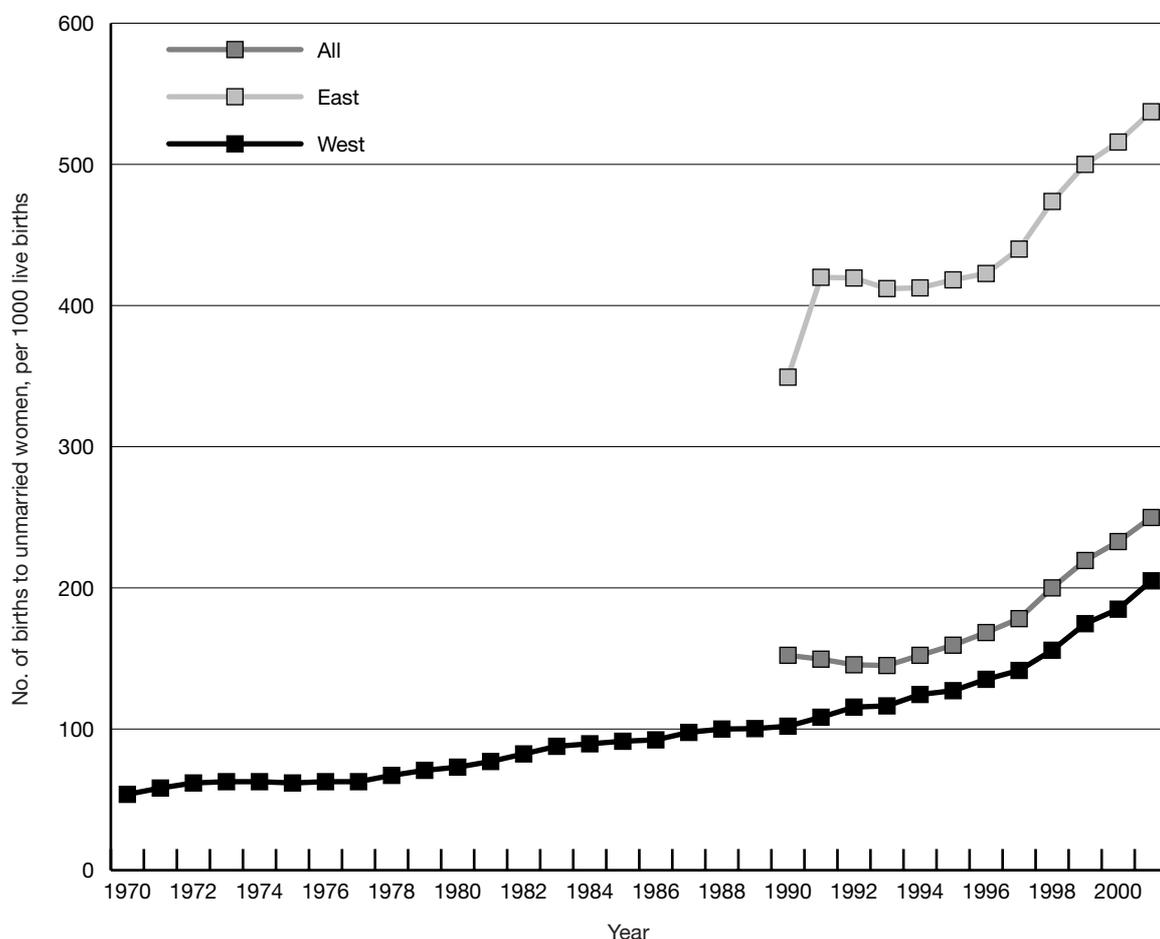
'Wir müssen und wir werden die Qualität von Bildung und Ausbildung deutlich verbessern und damit die Lebenschancen insbesondere junger Menschen erhöhen. ... [Wir begreifen] es als unsere vordringliche Aufgabe, Deutschland zu einem wirklich kinderfreundlichen Land zu machen. ... Genauso wenig, wie der Zugang zu erstklassigen Bildungsangeboten vom Geldbeutel der Eltern abhängen darf, dürfen Bildungschancen vom Wohnort bestimmt sein.'<sup>1</sup>

The relevance of studying the effects of family structure is underlined by the large changes in family structure that have occurred over the last three decades in Germany. As in many other western developed nations, growing numbers of children have been experiencing life in a lone-parent family. To the extent that life in a lone-parent family has an adverse effect on later-life attainments, increasing numbers of children have become at risk of experiencing this disadvantage.

Trends in family structure are shown in Figures 1–3 for the former West Germany from 1970 onwards and also for East Germany and all Germany from the 1990s onwards. Figure 1 shows that the number of births to unmarried women in Western Germany has increased steadily since the 1970s, with the rate of growth faster during the 1990s (in part reflecting growing numbers of births in cohabiting partnerships). The increase between 1970 and 2000 was from 54.6 births per 1,000 to 186.5 – ie about 340%. (The increase between 1990 and 2000 in the all-Germany rate was 78%.) Over the same 30-year period, the divorce rate in West Germany rose (apart from a sharp dip in the late 1970s): see Figure 2. After a precipitate drop in the divorce rate around the time of Reunification, the rate in East Germany rose steadily. Between 1991 and 2001, the all-Germany divorce rate rose by 47% from 70.5 to 103.4 per 10,000 marriages. Reflecting the trends in extra-marital birth and divorce rates, the number of lone-parent families has increased steadily since 1970, apart from a small decline in the late 1980s: see Figure 3. Between 1991 and 2001, the proportion for all Germany rose from 11.5% to 13.6% of all families.

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<sup>1</sup> 'We must and we will significantly improve the quality of education and training, and thereby improve the life opportunities of young people in particular...(We see it) as our most urgent task to make Germany a truly child-friendly country ... Just as the access to a first-rate education cannot depend on how much money parents have, educational opportunities cannot be determined by where one lives.'



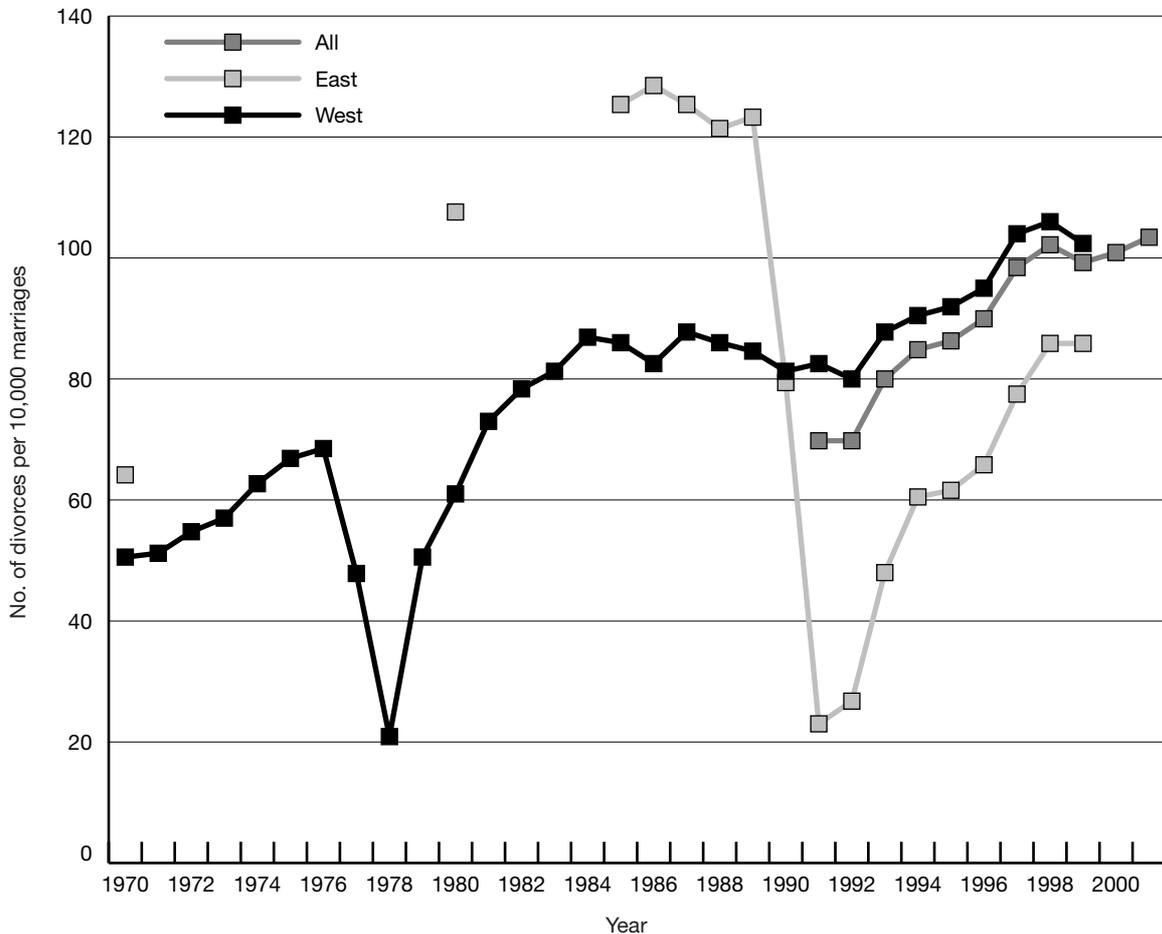
**Figure 1**  
**Number of births to unmarried women per 1,000 births**

Source: ZUMA (2004)

## How might family structure in childhood affect later-life attainments?

Aggregate expenditures on children (as in the US example cited earlier) alert us to the magnitude of investments in children, but are poor guides to the diversity and complexity of the ways in which parents and families may affect child outcomes. In this section, we provide an overview of the mechanisms by which family background (family structure in particular) and other factors affect later-life socioeconomic attainments. This framework underlies the applied research – including our own – which has aimed to establish the relative importance of the various influences using longitudinal survey data.

A schematic summary of the causal pathways from family background to children’s attainments is shown in Figure 4, borrowed from the magisterial survey by Haveman and Wolfe (1995). On the right-hand side of the figure are attainments, referred to as ‘final schooling level’ and ‘income’ where the latter is a label that could encompass a range of

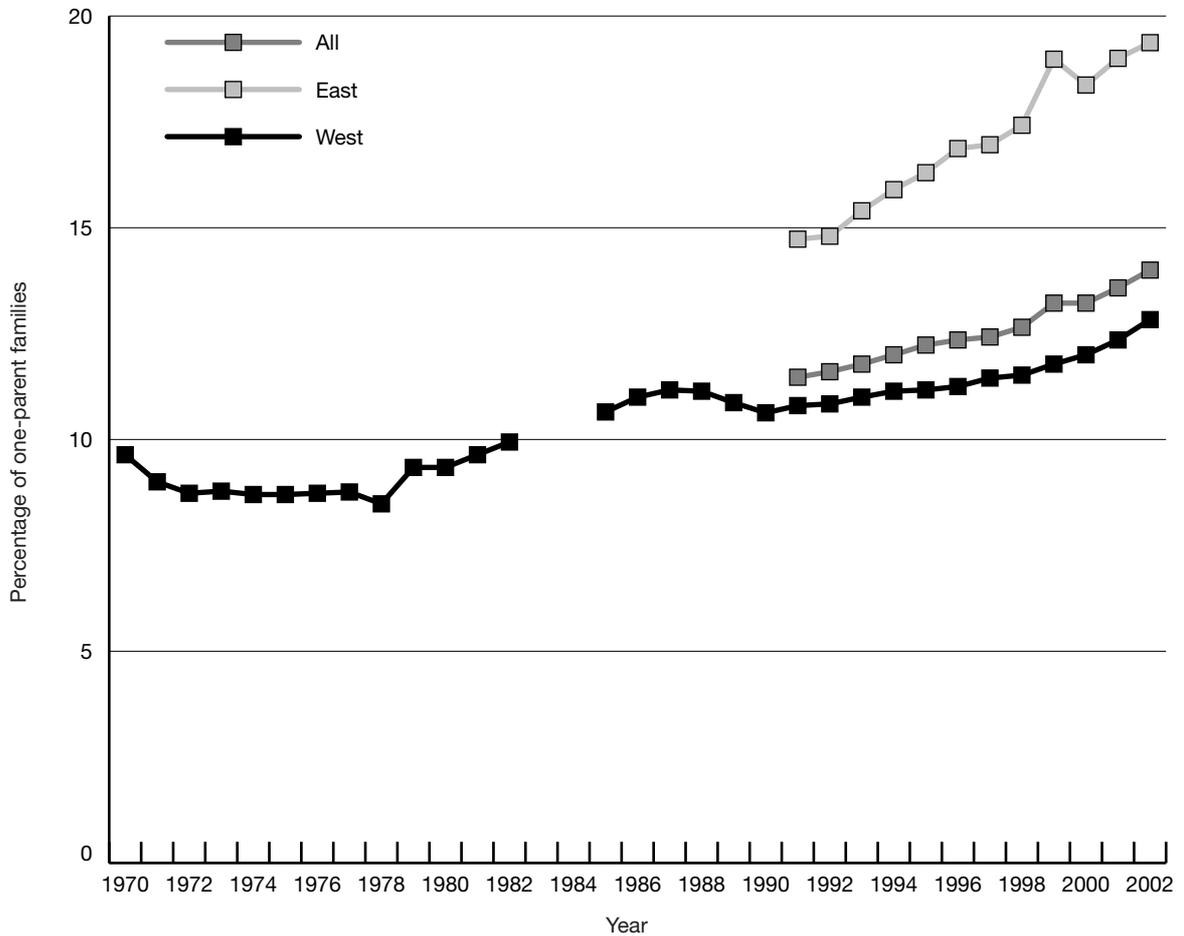


**Figure 2**  
**Number of divorces per 10,000 marriages**

Source: ZUMA (2004)

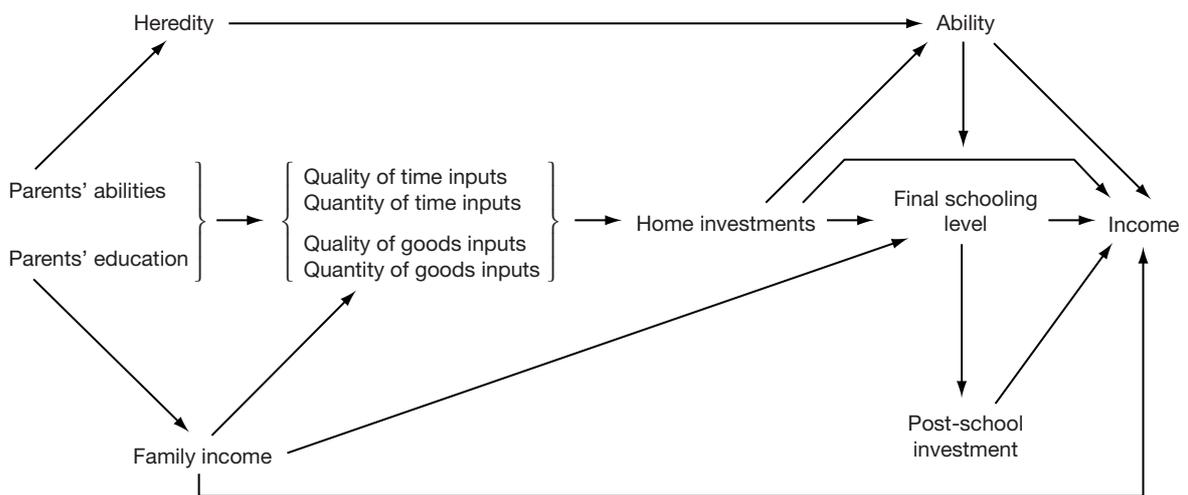
different outcomes in addition to purely financial variables – for example, employment status or health. Income (and these other attainments) is determined by schooling, post-school investments (for example, on-the-job training) and ability. Educational achievement depends on ability, family income and home investments. Ability is determined by (genetic) heredity and home investments. Central to the determination of attainments are home investments, generated by the combination of parents’ time and purchased goods and services. Figure 4 also reminds us that quality matters as well as quantity: children benefit more from a balanced diet of nutritious food than from blow-outs on crisps, cola and confectionery, for example.

Families differ in their capacities to make home investments. Better-off parents can spend more on their children, whether on better childcare, food, housing or more books, supporting them in further and higher education, and so on. Regardless of family income, differences in parental abilities and education also matter for home investments in a number of ways. For example, they may lead to differences in children’s attitudes to learning and their aspirations, in parental capacities to help children learn and in parenting skills in general.



**Figure 3**  
**Number of lone-parent families, as percentage of all family types**

Source: ZUMA (2004)



**Figure 4**  
**Home investments in children**

Source: Haveman and Wolfe (1995, Figure 1).

The type of family that one grows up in during childhood – whether an ‘intact’ family (with both parents) or non-intact family (with a lone parent) – is not shown explicitly in Figure 4, but can be understood to affect the quantity and quality of home investments that children receive in a variety of ways. Most obviously, if there is only one parent present rather than two, then the amount of parental time potentially able to be spent with children is reduced. Although a lone parent may increase their caring time to offset this, there is greater risk of tiredness and the ability to do so is decreased if they also have to spend time in paid work. Of course, lone parents are also at relatively high risk of being poor, but we are discussing here the impacts on attainments of family structure per se, rather than of low family income (which has its own separate causal path in Figure 4).

Absence of a parent may also have impacts on children’s attainment by affecting their aspirations and the role models available to them. For instance, it has been argued that, because fathers typically have higher occupational and social class positions than mothers and because mothers are usually the custodial parents after divorce, children of parents who separate are likely to experience disadvantageous downward social mobility, regardless of changes in economic status (Jonsson and Gähler, 1997).

The events of divorce and other changes in family structure may have effects on later-life attainments in addition to, or separately from, the effects of the absence of a parent that is associated with them (as discussed earlier). Jonsson and Gähler’s (1997) ‘crisis model’ of divorce refers to the ‘emotional upheaval and disturbed social relations in a family during the process of divorce [that] negatively affect children, causing stress, depression and/or behavioural problems’ (1997: 277). Repartnership of a lone parent, or the arrival of step-siblings into a child’s family, might also be stressful and have adverse effects on a child’s psychological development.

The characterisation of the determination of attainments summarised by Figure 4 is shared by most social scientists, although different disciplines have emphasised different aspects of the process. For example, economists have stressed the role of parental choices in determining home investments. Parents and families are viewed as economic decision-making units that care about the success of their children, and who allocate resources of time and money to this end, subject to constraints on parental time and income.

Investments in children are also affected by governments, of course, either through their setting the ‘rules of the game’ (for example, by mandating a minimum school leaving age or parental leave programmes) or directly by providing resources of cash and kind (for example, through subsidised childcare and schooling, and cash benefit programmes). Also not shown in Figure 4 are potentially important mediating factors on attainments such as the characteristics of the local neighbourhood and the ‘social capitals’ associated with local networks of friends and relations. And glossed over as well are issues of the timing of investments or success-inhibiting factors during childhood, emphasised by child development psychologists. A lack of resources or experience of stressful events during periods in early childhood crucial for child development can have a cumulative effect on later progress.

Whether parents are active choosers (as emphasised by economists) or passive actors in the home investment process has implications for estimation of the true impact on attainment of differences in childhood family structure and whether their effects are confounded with those arising from differences in other factors. For example, attainments may depend on childhood family structure and other factors including

children's 'endowments', but parental choices about whether to stay together may also depend on their children's 'endowments'. (In terms of Figure 4, imagine an additional arrow leading back from the child's 'ability' to home investments.) More generally, if there are dimensions of child endowments that are not observed by researchers in their datasets, then their estimates of the effects of family structure on attainment will partly reflect the effects of differences in endowments rather than the 'true' family structure effect. We return to the crucial issue of how to establish causality in the next section and at greater length in Chapter 3.

## **What do we know about the effects of family structure on later-life attainments?**

Most of what we know about the impact of family structure on later-life attainments comes from the large number of studies for the United States, supplemented by a few studies for Britain, Canada, France and Sweden. Many US studies have found that growing up without one of the biological parents is negatively associated with schooling success and with a number of other indicators of economic success, such as employment and earnings. The picture is not clear-cut, however. (See the extensive reviews of evidence by McLanahan and Sandefur, 1994, and Haveman and Wolfe, 1995.) We return to the evidence from other countries in more detail when reflecting on our own results in the concluding chapter.

For Germany, there has been little previous analysis of the effects of family structure. There are two studies of the effects of family structure on the school track followed by children at age 14 using data from the German Socio-Economic Panel (SOEP). Jenkins and Schluter (2002) estimated models with explanatory variables that included the experience of parental marital dissolution and re-partnering. They reported that these variables were never statistically significant and their exclusion did not change the estimated effects of the variables of principal interest in their study (measures of family income by childhood stage). Mahler and Winkelmann (2004) found that growing up in a lone-mother family slightly reduced the probability of being in the *Gymnasium* track, but also report that most of this adverse effect was due to lone mothers' lower incomes. Bohrhardt (2000) reported that there was no impact of experience of parental marital dissolution on the probability of getting a school-leaving certificate (Schulabschluss) in West Germany using data from the 1988 Family Survey of German Youth Institutes. (There are several studies for Germany of the impact on educational attainment of family background, but these did not examine family structure specifically – see, for example, Sieben et al, 2001, or Dustmann, 2004.)

Unambiguous conclusions about the effects of family structure are difficult to draw for several reasons. First, debate continues about the extent to which the impact of family structure is genuinely causal. Living in a lone-parent family is correlated with many other disadvantages, and the inferior later-life outcomes associated with lone parenthood may be due to those factors rather than lone parenthood itself. The attempts to address this and related issues have led researchers to use different types of statistical models and datasets, and the estimates are not always easily comparable.

Second, there are many socioeconomic attainment variables of potential interest, ranging from educational success to health, employment and wages, and the impact of family structure need not be the same for each of them. Similarly, the family structure is itself multi-dimensional – for example, differences in family structure might refer to effects arising from the absence of a parent and/or the stressful event of divorce. Different studies may focus on one aspect or another, and use different sets of variables to control for the effects of others (Todd and Wolpin, 2003).

Third (and related), differences in results may arise because studies refer to different countries with different sets of social institutions, norms and family support arrangements (or to different time periods for the same country). Of course, these differences are of substantive interest. If growing up in a lone-parent family has deleterious consequences for attainments in one country but not another, then this provides clues about which policies are effective in reducing the intergenerational transmission of disadvantage. Jonsson and Gähler (1997) have argued that:

[i]t is likely that psychological reactions to the emotional upheaval connected with separations (as in the crisis explanation) depends little on variations in socio-political context. In contrast absent-parent explanations focusing on lack of resources ... are contingent on labor-market opportunities for men and women, on child-care arrangements, on taxation policies, and on the coverage and level of child support and other welfare programs. Thus the consequences of family dissolution for children's economic situations may vary greatly between nations.' (Jonsson and Gähler, 1997: 278)

## **Distinctive features of the research**

The principal aim of our research is to fill the large gap in the evidence base for Germany about the effects of childhood family structure on socioeconomic attainment. There are three distinctive features of our work.

First, we consider a number of different outcomes for young adults, covering educational attainments, health and the labour market:

- *Education*: highest educational qualification (whether *Abitur* or higher) and school track at age 14 (ie whether attending a *Gymnasium*);
- *Health*: whether the individual smokes, and whether in poor health (self-assessed);
- *Labour market*: whether unemployed, whether receiving social assistance, and earnings (for those who have a full-time job).

These outcome measures are similar to those used in previous research. The relatively comprehensive coverage of different sorts of outcomes enables us to assess whether the effects of family structure are universal or diverse.

Second, we subject our findings to extensive robustness checks. As mentioned earlier, assessment of the 'true' causal effects of family structure is a tricky business, and so we have used a combination of statistical methods in order to check whether each points to the same conclusion or not. We also use multiple definitions of 'family structure',

including whether the individual ever experienced life in a non-intact family during childhood, and, if so, the number of childhood years spent in such circumstances.

Third, we derive and compare estimates for three samples of young adults:

1. *West German sample*: individuals who grew up in a family from the former West Germany headed by a native German;
2. *Guestworker sample*: individuals who grew up in a family from the former West Germany headed by a guestworker; and
3. *East German sample*: individuals who grew up in a family from the former East Germany headed by a citizen of the former German Democratic Republic (GDR).

These samples correspond to the three main samples in the dataset that we use throughout the analysis – the German SOEP, discussed further in the next chapter.

The samples provide an opportunity to explore the extent to which the effects of family structure may differ within different social and cultural environments. We have already seen how family structure patterns and trends differed between the former East Germany and West Germany (Figures 1–3), and of course there were also marked differences in the labour force participation rates of mothers and in state support for families. Sieben et al (2001) contrast the enduring importance of family background in determining educational success in the former West Germany with the lower impact of the family in the former East Germany, and we are able to explore whether this cross-sample difference holds for the impact of family structure more specifically, and also for outcomes other than educational success.

The guestworker sample adds a further contrast. Sample members grew up in the former West Germany, but their family was headed by someone from Turkey, Greece, the former Yugoslavia, Spain or Italy. In other words, there was substantial ethnic and religious diversity compared to the native German sample members, likely to be reflected in different styles of childraising and attitudes to the ‘family’. Recent studies have documented divergent trends in educational attainments of German-born children of immigrants and German nationals, and only a slow convergence in the school performance of East and West Germans (Haisken-DeNew et al, 1997; Jeschek, 2000; Riphahn, 2004). Our analysis helps examine whether the family – in particular, childhood family structure – plays a role in magnifying or attenuating such differences.

Our research design – including the type of survey data, the measures of outcomes and explanatory variables, and the statistical methods – is intentionally very similar to that used in previous research for Britain by Ermisch and Francesconi (Ermisch and Francesconi, 2001a, 2001b; Ermisch et al, 2001, 2004). This enables us to make some comparisons between Britain and Germany that are less subject to the potential problems of comparability that were referred to earlier, thus potentially revealing genuine cross-national differences rather than measurement ones. Do British findings carry over to Germany where fewer mothers work when their children are young, where lone parenthood is rarer, the schooling system is less diverse and the social insurance benefit system is more extensive?

## **Outline of the report**

Our report consists of five chapters in addition to this Introduction. Chapter 2 introduces our dataset, the German SOEP, and explains how we used it for intergenerational analysis and what the measures of attainment and family structure are.

To set the scene for the multivariate statistical analysis that follows, we show in Chapter 3 how, for most of the attainment variables that we consider, outcomes were worse for children who grew up in a non-intact family than for children who grew up in an intact family – and for all three samples. One cannot conclude from these raw associations that family structure has a genuinely causal effect on the outcomes – the associations may arise simply because family structure and the outcomes are each caused by a third set of factors. The remainder of the chapter therefore explains the different statistical methods that we use in order to identify the true impact of family structure.

Our findings, derived using these statistical methods, are set out in the next two chapters. Chapter 4 discusses the results for educational attainments, and Chapter 5 those for health-related and labour market variables. The final chapter, Chapter 6, summarises the findings, and places them in the context of findings from other recent research. As we shall see, our ‘bottom line’ conclusion is that there are clear-cut causal effects of family structure for some socioeconomic attainments of young adults in Germany, but not others. The pattern of results differs from that for several other countries, and we reflect on why this is the case.

## **2 German Socioeconomic Panel (SOEP) data and the measures used**

We use data from the German SOEP. The first wave of this was a nationally representative sample of the population of the former West Germany living in private households in 1984. This included an over-sample of guestworkers (foreign-born residents and their children, mainly recruited abroad during the economic booms of the 1960s and 1970s). Since 1990, there has also been a SOEP sample based on households in the former East Germany. In each of the three samples (West German, Guestworker and East German), original sample respondents have been followed and they (and co-resident adults) interviewed at approximately one-year intervals subsequently. Children in original sample households have also been interviewed in their own right when they have become adults (the year in which they turn 17). See Wagner et al (1993) for an overview of the SOEP, and <http://www.diw.de/english/sop/index.html> for full details and documentation.

In this chapter, we first describe how data from the German SOEP can be used for intergenerational analysis. Then we describe the variables underlying our analysis: the measures of socioeconomic attainments and of family structure, and the other explanatory variables used to model outcomes.

### **Intergenerational analysis using the German (SOEP)**

The ideal research design for studying the relationship between socioeconomic attainment and family background would involve having survey data for a large random sample of children, followed from birth through childhood (with measures of parental background and other relevant factors at each stage) to adulthood (when outcome measures were available).

The problem is that, even though the SOEP is one of the longest running household panel surveys in the world, the data available to us from the annual interviews for the main samples (for native West German and guestworker households) only cover a 19-year span (1984–2002). For respondents in the sample of residents from former East Germany, some data are available from 1990 onwards, with full earnings and income data from 1992. Thus, if one relies on the annual interview data alone, the number of young persons with information covering all childhood and subsequent outcomes is relatively small, thereby constraining analysis substantially. If one examines outcomes during adolescence – for example, school type attended at age 14 (cf Jenkins and Schluter, 2002), the small sample problem is reduced somewhat but remains a constraint and, of course, one cannot examine the many other outcomes of interest for young adults, such as their labour market attainments.

The solution to the problem is to combine annual interview data from the main panel survey with retrospective life-history data collected for parents and covering a much

longer period, including their children's childhood. This method works in the following way.

The SOEP interviews all the adults in each sample household annually and, in the year in which each child in a sample household turns 17, that child becomes a full member of the panel and is interviewed in their own right annually thereafter. (The children are interviewed even if they have left their parents household to set up their own.) For every young person who has lived at least one year during the life of the panel, we can link that person to the household containing their parents, and hence the information provided by parents at earlier interviews. Crucially, this information, derived by retrospective recall, includes histories of parental employment and jobs, marital histories, and background information about fixed variables such as parental and grandparental educational qualifications and dates of birth. We therefore match the calendars of life-history data with the calendars covering each young person's childhood. In this way, we can build up a picture of each young person's family structure and economic position during childhood, even if the calendar time spanned by their childhood refers to dates prior to the first interviews of the SOEP in 1984.

If we were to rely on the annual interviews for information covering both childhood and outcomes, then we would be restricted to impractically small samples (children born 1983–1986) and outcomes would refer to attainment at some age below 17. No children from the former East Germany could be included in this sample. By contrast, if we derive the information about childhood via matching with the parental retrospective life-history information, then samples can be based on children born between 1968 and 1986, including children from the former East Germany. Moreover, with samples based on the children born in the earlier years, one can examine outcomes that reach quite far into adulthood (and thence derive more reliable indicators of lifetime achievement than are provided by, for example, early adulthood earnings and employment). Samples are large even if one looks at outcomes measured at around age 25.

The data matching process provides samples of children who were living with their parent(s) for at least one year during the life of the SOEP. This sample selection condition has the potential to lead to biases in estimates of the relationship between outcomes and their determinants if there are unobserved factors affecting outcomes that also affected the chances that children would be living with their parents. The most straightforward way to address this problem is to work with a sample that provides the largest nationally representative sample of children for whom there is information about each of the specific outcomes of interest.

Thus we first selected from the SOEP children who:

- (a) were aged 18 or less in the first year that we observed them in the SOEP;
- (b) were living with their mother for at least one year between 1984 and 2002;
- (c) did not have disabilities (ie had a severity score of less than 30% on an official medical certificate); and
- (d) had mothers with complete family and employment histories over their entire childhood – ie from birth to the child's 16th birthday. (A very small number of lone-father families were excluded from the analysis.)

Criterion (a) avoids overrepresentation of children who left their parents' home at late ages. Because only 7% of people aged 18 or less had left their parental home in Germany (Iacovou, 2002), our sample is not likely to suffer from serious selection bias. Criterion (b) is necessary in order to match children to mothers who are SOEP respondents themselves. Criterion (c) reduces the possibility that parents may have chosen family structure patterns (and other behaviour, such as employment) during the child's childhood on the basis of considerations of the child's health (in which case we may get biased estimates of the effects of family structure – as explained earlier). Finally, we impose criterion (d) in addition to (b) so that, by construction, we have full information on both childhood family structure and maternal employment – a variable that many analysts believe is an important determinant of children's educational attainment and other outcomes (see, inter alia, Baum, 2003; Ermisch et al, 2004; Ruhm, 2004).

The sample selection criteria resulted in a sample size of approximately 1,300 for the West German sample, 700 for the Guestworker sample and 470 for the East German sample (covering the 1990s only). The number of observations also depended on the outcome being studied.

## The measures of socioeconomic attainment

In this section, we explain how we measured the outcome variables summarising educational attainment, health and labour market success.

### Educational attainment

We construct two types of measure capturing a number of different aspects of success. To put them into context, first we provide some information about the German school system. (See, inter alia, Dustmann, 2004, or Sieben et al, 2001, for more details.) Education begins with voluntary pre-school kindergarten. Compulsory school attendance starts at the age of six, and ends at the age of 18. Primary school covers the first four years, after which children continue their education in secondary schools. There are three main types: *Hauptschule*, *Realschule* and *Gymnasium*. *Hauptschule* offers the lowest level of secondary education. After its completion at the age of 15–16, with or without a formal leaving certificate, *Hauptschule* graduates typically proceed to a vocational training track combining a three- or four-year apprenticeship with attendance at a technical training college. *Realschule* leads to a leaving certificate after six years (when students are aged 16), and is generally followed by attendance at a further education college combined with an apprenticeship or (rarely) a move to a *Gymnasium*. *Gymnasium* ends at the age of 18–19, after a total of 13 years of formal schooling, and leads to the *Abitur*, the qualification required for entry to universities or other institutions of higher education. Since education is a responsibility of the states (*Bundesländer*), and not of the federal government, this description may differ slightly from state to state. For example, in some states there is a higher prevalence of secondary school tracks other than the three main ones, and differences in the length of each track, but such differences are modest. (We discuss these further at the end of Chapter 3.)

This discussion refers to the system applying in the former West Germany which, after Reunification, was also adopted in the former East Germany (Jeschek, 2000). The

educational system in the former German Democratic Republic (GDR) was broadly similar to that in the rest of Germany, with some differences in the length of the various tracks (for example, completion of *Gymnasium* schooling required eight rather than nine years).

We study two outcome measures:

- Highest educational qualification is *Abitur* or higher (among those aged 19+ when last observed in the panel);
- *Gymnasium* attendance at age 14.

The measures are based on the key division between those who have the *Abitur* (or are in the school track in which one can attain it) and those who do not. It is well known that the choice of different secondary school tracks leads to sizeable wage differentials over the life cycle, and having the *Abitur* or some higher educational qualification is associated with the highest wage profile (Dustmann, 2004). Almost 36% of the young people in the West German sample had qualifications to at least *Abitur*, compared with slightly fewer (33%) in the East German sample and only 19% of the Guestworker sample. See Table 1 for details.

**Table 1**  
**Percentages with each outcome, by sample**

Outcome measure	West German sample	Guestworker sample	East German sample
<b>Educational attainment</b>			
<i>Abitur</i> or higher qualification	35.9	19.1	32.5
Attended <i>Gymnasium</i> at age 14	37.8	16.5	41.4
<b>Health outcomes</b>			
Current smoker	36.3	41.4	43.2
In poor health	5.1	4.6	4.7
<b>Labour market outcomes</b>			
Unemployed	4.2	8.0	13.7
Social assistance receipt	2.8	3.5	3.1
Earnings (mean, Euro, 2000 prices)	1,888	1,774	1,348

### Health outcomes

We analysed two measures summarising aspects of a respondent's health:

- smoker currently (measured at waves 15–16 and 18–19); and
- in poor health (measured at waves 9 and 11–19).

Whether someone smokes or not is a good predictor of poor health later in life. The 'in poor health' variable is derived from responses 'poor' or 'bad' on a five-point scale to a question asking 'How would you describe your current health?'. Some 36.3% of the West

German sample smoked, 41.4% of the Guestworker sample and 43.2% of the East German sample (Table 1) About 1 in 20 respondents described themselves as being in poor health (slightly more in the West German sample, slightly less in the other two samples).

#### Labour market outcomes

We considered three measures of labour market disadvantage:

- unemployment (measured at all waves for those aged 25+ and not in full-time education or training);
- social assistance receipt (measured at all waves for those aged 17+); and
- earnings (for individuals in full-time employment).

The first measure refers to whether a respondent was registered as unemployed. (The restriction to those aged 25+ excludes years immediately after secondary school which may be less representative of the longer term picture. Individuals in full-time education or training are not able to be registered unemployed.) The average unemployment rate was 4.2% for the West German sample, 7.9% for the East German sample and 13.7% for the Guestworker sample (Table 1). The second measure referred to whether the respondent lived in a household receiving social assistance (*Sozialhilfe*). Differences were smaller across the samples than for unemployment rates: 2.8% of respondents were in households receiving social assistance in the West German sample, 3.5% in the Guestworker sample and 3.1% in the East German sample. (Some children had not yet left home and so eligibility for the social assistance receipt refers to their parents' circumstances as well as their own.)

Earnings refer to gross monthly wages for full-time employees, and are expressed in Euro (in real terms; prices for year 2000). As expected, earnings were highest for the West German sample on average (€1,888 per month) and lowest for the East German sample (€1,348 per month). The average for the Guestworker sample was €1,774 per month.

## Measures of family structure

All our measures of family structure are constructed using the retrospective marital history information provided by mothers. They are as follows:

- Lived in a non-intact family at some time during childhood;
- Lived in a non-intact family during childhood, by childhood stage (ages 0–5, 6–10, 11–16);
- Lived in a non-intact family during childhood, and whether parents divorced or father died;
- Lived in a non-intact family, with or without (re)partnership;
- Proportion of childhood spent in a non-intact family; and
- Proportion of childhood spent with an unmarried, divorced or widowed mother.

The first four measures concern the non-intactness of a family. We defined living in an intact family as meaning living continuously with both parents (biological or adoptive) from birth until the 16th birthday. Thus a child would have spent time in a non-intact family if they had ever lived with a biological or adoptive mother who was not married before her 16th birthday, either because of a partnership dissolution (through divorce or father's death) or because the child was born outside marriage. 'Intactness' refers to the intactness of legal marriages and does not take account of cohabiting partnerships of unmarried parents. In addition, because the SOEP retrospective marital histories refer to the date of divorce rather than of marital separation, there may be some measurement error in our estimates of the dates of lone parenthood.

The first measure simply records whether the child was ever in a non-intact family. This is by far the most commonly used measure in previous research. The second and third measures take account of when non-intactness occurred and why. The second measure distinguishes between three childhood stages (ages 0–5, 6–10 and 11–16). A number of previous studies have reported different impacts of the experience of a non-intact family depending on the age of the child when the dissolution occurred (Ermisch and Francesconi, 2001a; Hill et al, 2001; Wojtkiewicz, 1993). The third measure distinguishes between children whose mother was single at their birth, children who ever lived with a divorced mother and children who experienced the death of their father during childhood. Earlier research has emphasised that parental loss through death could be less correlated with unobserved attributes of family background than parental loss through divorce (Corak, 2001; Lang and Zagorsky, 2001) – that is, individuals from bereaved families represent a benchmark from which to judge whether family structure is affected by child endowments (see the discussion of methods in Chapter 3). We also considered measures that distinguished between combinations of non-intactness type and timing, but we do not report the results based on these because analysis using them added little to our story.

Our fourth measure distinguishes children according to whether non-intactness arose via parental death or divorce, and also by whether there was repartnering during childhood. We identify six types of children according to the following circumstances:

1. lived with a never-married single mother throughout childhood;
2. lived with an unmarried mother at birth who partnered during their childhood;
3. lived with a divorced mother who did not remarry by their 16th birthday;
4. lived with a divorced mother who remarried sometime during their childhood;
5. father died and mother did not remarry; and
6. father died and mother remarried.

A large body of research has pointed out that remarriage can either adversely or positively affect children's well-being (Biblarz and Gottainer, 2000; Björklund et al, 2004; Cherlin, 1978; Ginther and Pollak, 2004; Hill et al, 2001; McLanahan and Sandefur, 1994; Wojtkiewicz, 1993).

All the measures described so far refer to the event of divorce or death, but not to how long the absence of a parent lasted. The final two measures are used to account for this dimension: the fifth measure is the total number of years spent in a non-intact family as a proportion of all childhood years, and the sixth measure breaks this down by type of

non-intactness (fraction of childhood spent with a mother who was single at birth, with a separated/divorced mother and with a widowed mother).

Summary statistics for the various family structure variables are shown in Table 2. There are distinct differences between the samples, as expected from the discussion of national trends in the Introduction. In our West German sample, one fifth of children (20.8%) lived in a non-intact family in at least one of their childhood years, and the average proportion of childhood spent in a non-intact family was 8.3%. (This average is calculated including the children always in an intact family fraction, for whom the proportion is equal to zero.) In the East German sample, the proportion of children who experienced life in a non-intact family is substantially higher – 30% – and the average proportion of childhood spent in a non-intact family is 12.6%. (These results are partly a cohort effect and not simply an ‘East Germany’ effect. Data for East Germany is only available for the 1990s, when the prevalence of lone parenthood was higher.) The experience of the Guestworker sample was at the other extreme: just under 1 in 10 children (9.5%) experienced life in a non-intact family, and the average proportion of childhood spent in a non-intact family was only 3.3%.

There are differences and similarities in when and how non-intactness arose. For example, divorce was the most common reason for non-intactness in the Guestworker and

**Table 2**  
**Family structure during childhood, by sample (percentages)**

	<b>West German sample</b>	<b>Guestworker sample</b>	<b>East German sample</b>
Ever lived in non-intact family	20.8	9.5	29.6
Ever lived in non-intact family and:			
Lived with non-married mother	5.7	3.5	13.5
Parents divorced	11.8	4.7	14.8
Father died	3.3	1.3	1.3
Ever lived in non-intact family at:			
Age 0–5	10.5	4.9	19.8
Age 6–10	5.0	2.2	4.9
Age 11–16	5.3	2.4	4.9
Mother’s partnership status:			
Unmarried at birth and married later	4.6	3.4	11.1
Never married	0.9	0.1	2.3
Divorced and remained unmarried	6.8	2.4	6.9
Divorced and remarried	5.0	2.3	8.0
Widowed and remained unmarried	2.6	1.3	1.3
Widowed and remarried	0.8	0.0	0.0
Percentage of childhood spent in:			
Non-intact family (mean)	8.3	3.3	12.6
With non-married mother (mean)	2.4	1.1	4.8
With divorced mother (mean)	4.8	2.0	6.9
With widowed mother (mean)	1.1	0.2	0.9

(especially) the West German samples, but among the East German sample it ranked equally with living with an unmarried mother. On the other hand, the experience of non-intactness was greatest at ages 0–5 for all samples (especially so in the East German one). Also similar across samples was the prevalence of different types of maternal partnership transitions: most common was an unmarried mother who later married (particularly in East Germany), divorced mothers who remained single, and divorced mothers who remarried.

### **Variables to control for other influences on attainment**

Our goal is to estimate the effects of family structure on socioeconomic attainment that control for the other potential influences. Fortunately, the SOEP data are particularly rich, and there is extensive information available about the individuals whose outcomes we are studying and about their parents, siblings and households generally. Our analysis uses a set of control variables that is similar to those often used in comparable research. More specifically, the measures are as follows.

Measures referring to the individual are:

- age;
- year of birth;
- sex;
- whether the child is an only child;
- measures of birth order (first born, second born, third born or higher);
- number of brothers and sisters; and
- region of residence (*Bundesland*).

The measures of maternal characteristics are:

- age at the birth of the individual; and
- highest educational attainment.

In addition, some estimates also control for:

- family income during childhood (total household annual income from the labour market, from investments and savings, and from private transfers, averaged over all childhood years for which income information was available); and
- the number of years that the mother worked part time and full time during the individual's childhood.

Table 3 shows the average values of these variables for the sample used in our analysis of educational attainment. (Summary statistics for the same variables as used in the analyses of other outcomes are omitted for brevity. They are similar to those shown.) Observe the emphasis on maternal characteristics rather than paternal characteristics, which is a consequence of the method in which our intergenerational samples are constructed (complete information is not available for fathers).

**Table 3**  
**Means of control variables, by sample**

Variable	West German sample	Guestworker sample	East German sample
Age	25.2	24.5	22.0
Age < 22	0.29	0.31	0.45
Age 22–25	0.28	0.34	0.49
Age >25	0.43	0.35	0.06
Year of birth	1974.2	1974.0	1979.3
Female	0.48	0.46	0.49
Only child	0.12	0.04	0.15
Number of brothers <sup>a</sup>	0.81	1.21	0.69
Number of sisters <sup>a</sup>	0.77	1.20	0.63
<b>Birth order<sup>a,b</sup></b>			
First child	0.38	0.31	0.48
Second child	0.40	0.32	0.42
Third child or more	0.21	0.37	0.11
<b>Mother's highest education</b>			
No leaving certificate or has general school certificate ( <i>Hauptschulabschluss</i> )	0.66	0.93	0.15
Intermediate school certificate ( <i>Realschulabschluss</i> )	0.25	0.02	0.57
Grammar school certificate ( <i>Abitur</i> )	0.03	0.01	0.04
University or technical college degree	0.06	0.04	0.24
Mother's age at birth of individual	26.9	26.2	24.4
<b>Number of years mother employed during individual's childhood</b>			
Full-time	3.27	6.45	12.67
Part-time	4.84	2.33	2.76
Household annual income, averaged over childhood (€, 2000 prices) <sup>c</sup>	42,384	35,763	34,585

<sup>a</sup> Includes adopted and foster children

<sup>b</sup> Computed for children with siblings only

<sup>c</sup> Average computed for all childhood years (0–16) for which household income was available.

Each sample contains equal numbers of young men and young women. Children in the West German and Guestworker samples are on average three years older than children in the East German Sample (25 rather than 22), and their mothers were also about five years older at the birth of the child. Guestworker sample members have more brothers and sisters (and a smaller fraction of them are only children) than the other two samples. Family sizes are smallest for the East German sample.

There are distinct differences in maternal educational qualifications and labour market experience across the samples. For example, almost all (93%) mothers of individuals in the Guestworker sample had no school-leaving certificate or only a general school-leaving certificate, and just under two thirds of the West German sample's mothers are in this situation. Only 15% of the East German sample's mothers are in this category. Remarkably, more than half of them have an intermediate school certificate, and almost one in four (24%) has a university or technical college degree (predominantly the latter). East German mothers also have the strongest labour market attachment, with an average of 13 years of full-time employment and three years of part-time employment during childrearing, as opposed to three years and five years among West German mothers and six years and two years among Guestworker sample mothers. Finally, and unsurprisingly, West German children grew up in more affluent families.

### 3 The effect of family structure on attainments: raw associations and assessment of causal effects

In this chapter, we first demonstrate that, for most of the outcomes that we consider, outcomes were worse for children who grew up in a non-intact family than for children who grew up in an intact family. There is therefore *prima facie* evidence that family structure does affect socioeconomic attainment. The remainder of the chapter therefore explains the different statistical methods used to assess how much of this raw association may be attributed to a genuine impact of family structure or to other factors. Results based on these methods are reported in the succeeding two chapters.

#### Raw associations between outcomes and family structure

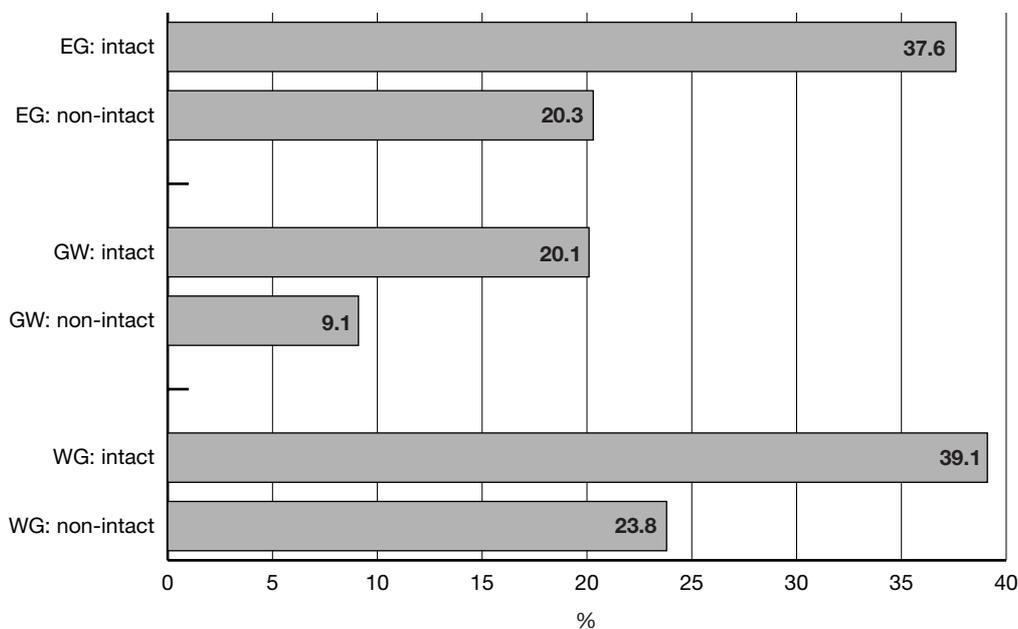
We summarise the raw associations between family structure and outcomes using the most straightforward of our family structure measures – namely, whether the individual was ever in a non-intact family during childhood.

For the two main educational attainment variables – having an *Abitur* or higher qualification, and attending *Gymnasium* at age 14 – there are clear differences in achievement between children from intact and non-intact families in all cases bar one: see Figure 5. In the West German sample, almost 40% of those from intact families had the *Abitur* or higher qualification, but less than 24% of those from non-intact families. The corresponding proportions are 38% and 20% among the East German sample, and 20% and 9% among the Guestworker sample. For *Gymnasium* attendance, there are similar differentials by family structure (with the exception of the Guestworker sample for which the differential is negligible).

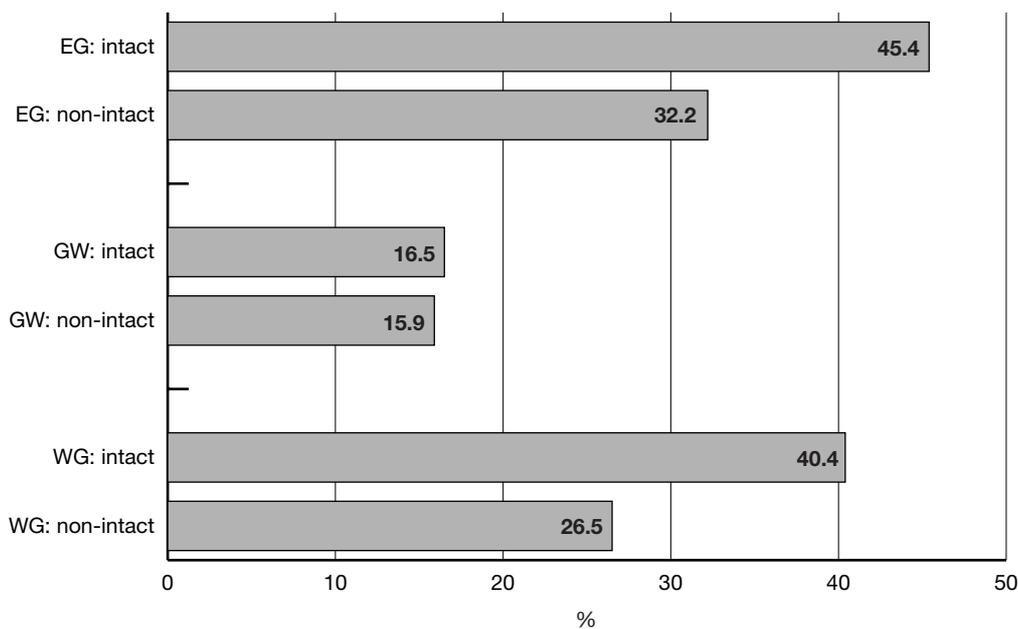
The differentials in health outcomes by family structure are shown in Figure 6. For all three samples, individuals from non-intact families are much more likely to smoke, to assess themselves as being in poor health, and to say that physical health problems limit their work or everyday activities.

Turning to the labour market outcomes (Figure 7), we find that individuals from non-intact families are more likely to be registered as unemployed and to live in households that receive social assistance. For the West German sample, the unemployment rate is 4.9% for individuals from non-intact families and 4.1% for those from intact families. Unemployment rates are higher for the other two samples, but so too are the differentials by family structure. Compare rates of 11% and 8% for the Guestworker sample, and larger still for the East German sample: 20% compared with 12%. Social assistance receipt rates are 8.7% and 1.4% for non-intact and intact families in the West German sample, and very similar in the East Germany sample (7.5% and 1.3%). The more muted differential for the East German and Guestworker samples is echoed in the results for

(a) *Arbitur* or higher educational qualification



(b) Attended gymnasium at age 14

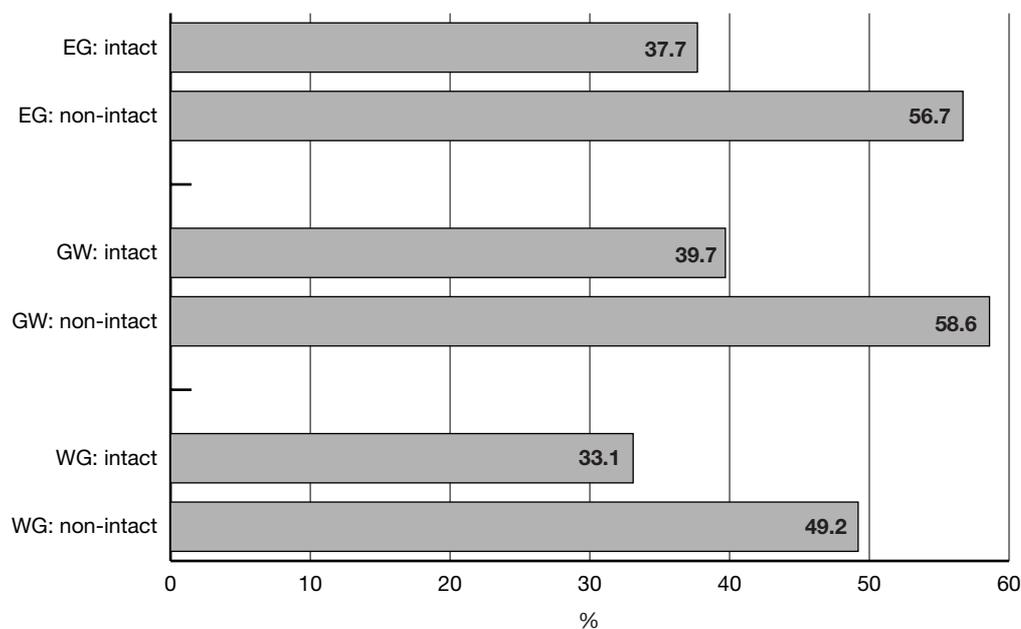


**Figure 5**  
**Family structure and education outcomes, by sample**

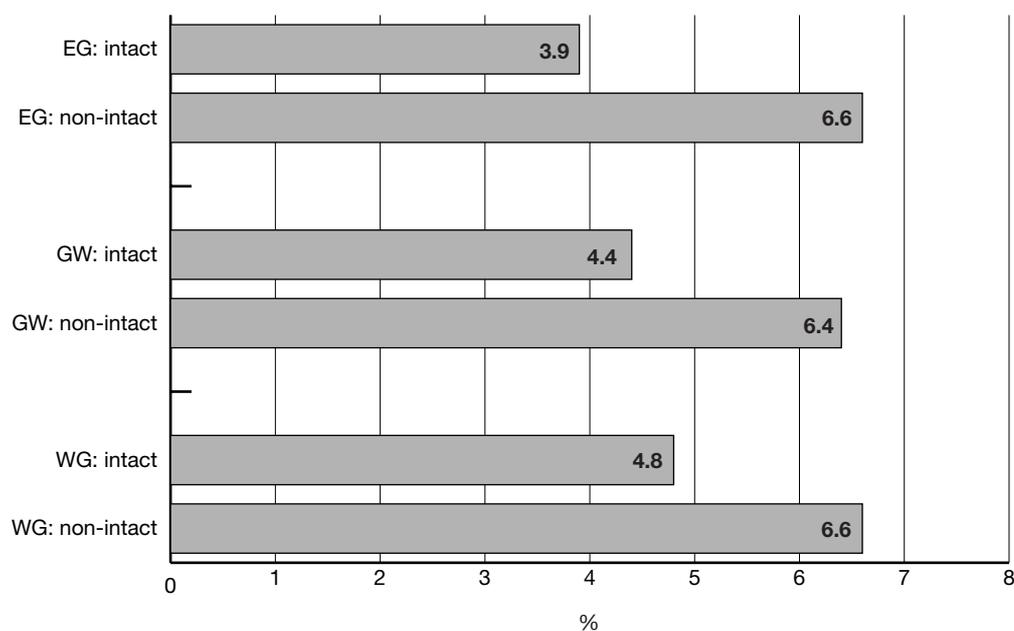
WG: West German sample; GW: Guestworker sample; EG: East German sample

earnings among full-time employees. For this outcome, the differential is clear for the West German sample, but small for the Guestworker sample and reversed for the East German sample (which may perhaps reflect a ‘sample selection’ effect – those with higher qualifications being less able to get a job during the early 1990s compared to the late 1990s and afterwards).

(a) Current smoker



(b) In poor health

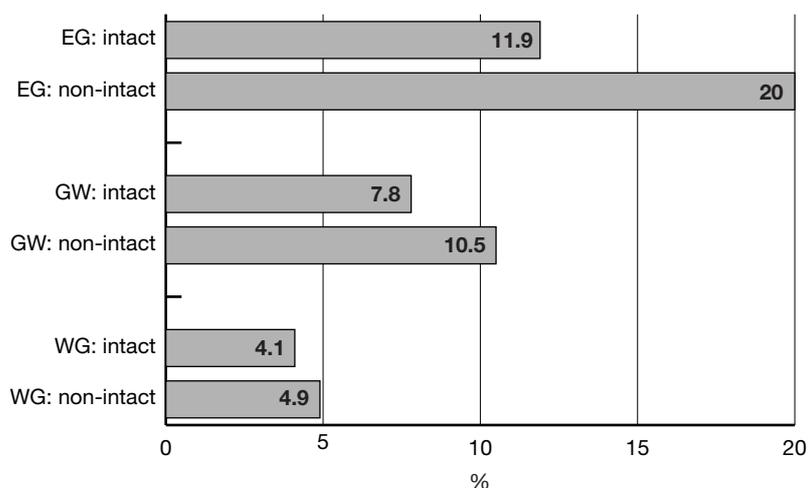


**Figure 6**  
**Family structure and health outcomes (percentages)**

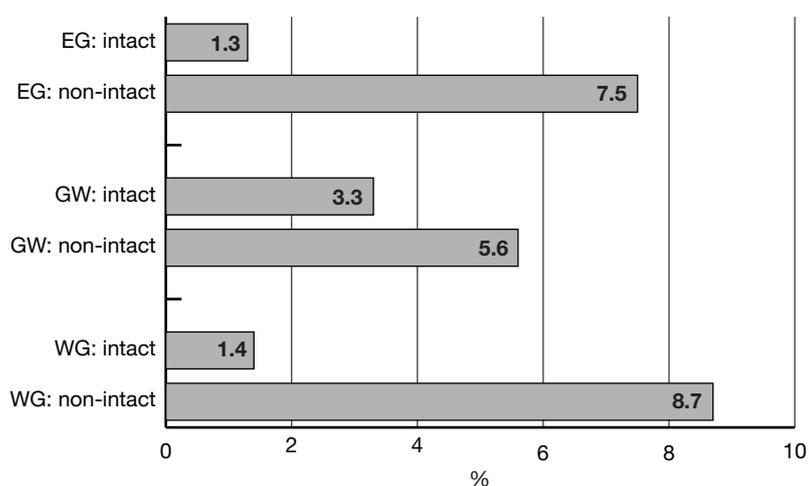
WG: West German sample; GW: Guestworker sample; EG: East German sample

In sum, the raw differentials in attainment between individuals from intact and non-intact families are marked, both for each sample and for each outcome. But can we conclude that it is differences in family structure that are actually responsible for the differentials, or are they due to some other factors that are correlated with family structure? In the rest of the chapter, we outline the methods used to answer this question.

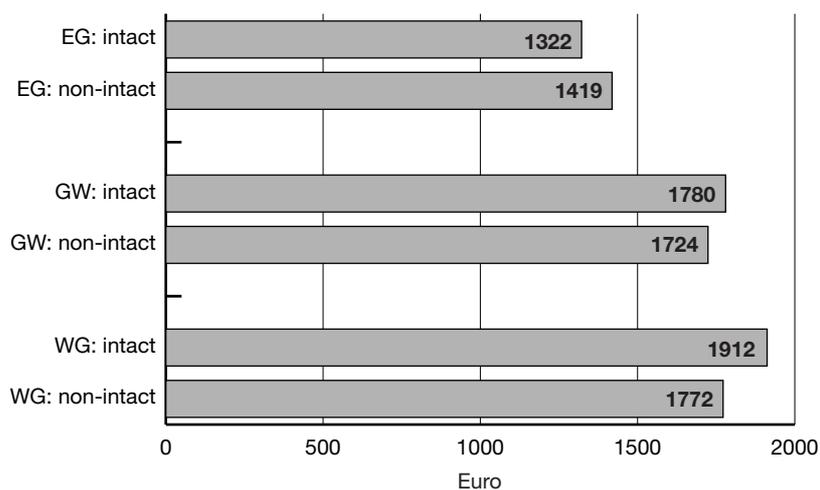
**(a) Registered as unemployed**



**(b) Receipt of social assistance**



**(c) Earnings (full-time employees only)**



**Figure 7**  
**Family structure and labour market outcomes**

WG: West German sample; GW: Guestworker sample; EG: East German sample

## Statistical methods to assess causal effects of family structure

The schematic model of the determination of attainments that was set out in the Introduction (Figure 4) indicated that in addition to family structure there were potential influences from a number of other influences, both observed and unobserved. It is these other influences that we wish to control for in order to assess the ‘true’ causal effect of family background. Because of the complexities of the processes leading to particular outcomes, there is no straightforward way in which to do this. Our strategy is to apply a number of different statistical techniques, each of which utilises a different set of assumptions. If each method points to the same result, then we may claim some robustness for our conclusions; if results differ, then we learn which sorts of assumptions about the model are critical for drawing conclusions. We use three methods, each of which is explained in the remainder of the chapter (see, *inter alia*, Ermisch et al, 2004, for a detailed technical exposition):

- Parametric regression models with ‘level’ estimators;
- Parametric regression models with ‘sibling difference’ estimators; and
- Non-parametric bounds estimators.

### Parametric regression models: level estimates

The parametric regression models can be viewed as a particular representation of the determination process shown in Figure 4. We suppose that:

- (1)  $Y_{ij}$             The outcome of interest for individual  $i$  from family  $j$  is a function of
- |                    |   |
|--------------------|---|
| $= \beta Z_{ij}$   | • family structure ( $Z_{ij}$ ),            |
| $+ \gamma' X_{ij}$ | • other observed influences ( $X_{ij}$ ),   |
| $+ \alpha_j$       | • an unobserved family-specific effect, and |
| $+ v_{ij}$         | • an unobserved individual-specific effect. |

The key parameter of interest – the causal effect of living in a non-intact family (say) – is the coefficient  $\beta$ . We are interested in not only its sign and magnitude, but also whether our estimate of it differs from zero in a statistically significant manner. Put another way, to be confident in asserting that living in a non-intact family has a deleterious impact on attainment, we need to find not only that the estimate of  $\beta$  is negative, but also that this did not arise by chance. We assess precision in the conventional way: we calculate the ‘standard error’ associated with each estimated coefficient, and view a coefficient estimate as statistically significant if the absolute value of the ratio of estimate to its standard error is greater than two.

Equation (1) is a standard linear regression model specification, and it is well known that application of standard estimation techniques leads to unbiased estimates of the model parameters, including  $\beta$ , as long as the observed influences on attainments ( $Z_{ij}$ ,  $X_{ij}$ ) are uncorrelated with the unobserved influences ( $\alpha_j$  and  $v_{ij}$ ). If one makes this assumption, then the only remaining complication is that the outcome variable is dichotomous rather than continuous, but this is easily addressed using standard logit regression techniques. Note that, instead of reporting  $\beta$  itself, we report its ‘marginal effect’, as this is in a metric that is more easily comparable across the different methods used. The marginal effect

shows the change in the probability of achieving the (dichotomous) outcome variable that is associated with a one unit change in the family structure variable  $Z$  (for example, living in a non-intact family rather than in an intact family).

Application of this method provides us with a set of 'level' estimates (the reason for this label will become apparent shortly). Many of the findings reported in the literature are based on level estimates, and so they provide an important reference point. Increasingly, however, it has been argued that it is implausible to assume that the observed and unobserved influences on attainment are uncorrelated with each other. The argument is related to assumptions about the nature of the attainment process.

The family- or mother-specific influences on attainment that are not observed by the researcher ( $\alpha_j$ ) include factors such as maternal 'ability' or any other fixed effect that is common among siblings within the same family (for example, maternal affection, motivation and work ethics). A proportion of these factors are likely to be inherited (Figure 4). The individual-specific family background influences on attainment are likely to depend not only on the given individual's endowments of intelligence and 'ability' (for example), but also the endowments of that individual's sibling(s): parental home investments in a child are likely to respond to that child's capacity to benefit from them, and also (differentially) to the capacities of their other children.

The key additional complication is that there may be feedback effects from child endowments to family structure: the extra arrow back from 'ability' to 'home investments' in Figure 4 that was mentioned earlier. Whether parents split up or stay together may depend on family-specific factors and also on child-specific ones – whether they have children with severe mental or physical impairments, or who are talented at music or sport, or are very able.

If there are these feedback effects, then the assumption that  $Z_{ij}$ ,  $\alpha_j$ , and  $v_j$  are uncorrelated is untenable (because each is associated with common underlying factors). Hence, estimates of  $\beta$  using the method described so far will be subject to bias. The degree of bias can be shown to depend on several aspects of the intergenerational transmission process, including the degree of heritability of endowments, the extent to which parents reinforce or compensate for cross-children differences in their children's endowments, and the nature of the response of family structure to family- and child-specific factors.

### **Parametric regression models: sibling difference estimates**

How might one address these problems? Estimation of 'sibling difference' models is a common answer. The models are grounded on the observation that siblings share many family-specific characteristics that are relevant to the attainment process – for example, '...biological or social parents, their parenting style, parents' social and cultural environments, housing and, to a large extent, neighbourhoods and schools' (Ermisch et al, 2004: 77). This means that one can control for the unobserved (and observed) effects that are common to siblings by looking at the differences in their attainment and relating these to sibling differences in the experience of life with different family structures. If we use the symbol  $\Delta$  to represent the difference between siblings, then we can rewrite equation (1) for a two-child family as:

$$(2) \quad \Delta Y_j = Y_{1j} - Y_{2j}$$

The difference in attainments between siblings 1 and 2 is a function of

$$= \beta \Delta Z$$

$$+ \gamma' \Delta X$$

$$+ \Delta v$$

- the sibling difference in family structures
- the sibling difference in other observed influences, and
- the sibling difference in individual-specific effects.

Estimation is based on observations of differences between pairs of siblings – hence the name of this model. (By contrast, the levels model discussed earlier was based on variables expressed in terms of levels of attainment rather than differences in such levels.) The key requirement for an unbiased estimator of  $\beta$  in the sibling difference model is that sibling differences in family structure ( $\Delta Z$ ) and sibling differences in unobserved individual effects ( $\Delta v$ ) are uncorrelated, which is a weaker criterion for unbiasedness than the levels estimator required. Intuitively, the reason is that the family-specific effect ( $\alpha_j$ ) is eliminated when taking sibling differences – it does not appear in equation (2) – and so many of the contributions to bias in the levels estimator no longer play a role (those related to the degree of heritability and to family structure responses to family-specific factors).

Use of sibling difference models does not guarantee that estimates of  $\beta$  are unbiased, however. There remain some child-specific feedback factors contributing to potential bias that were also relevant to the estimation of the levels model. However, it can be shown that, if the impact on family structure of differences in children's individual endowments is negligible, the sibling difference estimate of  $\beta$  is unbiased (Ermisch et al, 2004: 77).

There is an additional complication that may bias sibling difference estimates (Ermisch and Francesconi, 2001b; Ermisch et al, 2004). Suppose a father develops a behavioural problem (unobserved by the researcher) – an example could be alcoholism – that does not affect the attainment prospects of his older child but does adversely affect the prospects of his younger child (because, for example, that child is exposed to it for a longer time). Moreover, in addition, the problem precipitates the divorce of the parents. In this situation, the sibling difference estimator overestimates the true family structure effect: the estimate partly reflects the influence of the unmeasured parental behaviour that is correlated with family structure.

In sum, the sibling difference approach is a useful addition to the modeller's toolbox, although it does not come without costs. There remain assumptions that may not be satisfied. Also, estimation is based only on families containing siblings. (Families with three or more siblings contribute more than one sibling pair.) This necessarily reduces sample sizes and so lowers the precision of estimates, other things being equal. The applicability of the method is also reliant on having sufficient variation in family structure between individuals from the same family. We have 693 sibling pairs in 317 households in the West German sample, 479 sibling pairs from 201 households in the Guestworker sample and 185 sibling pairs from 90 households in the East German sample – ie substantially fewer observations than used for estimation of the levels models. A further complication is that the conditional logit version of the sibling difference model, appropriate for the case of a dichotomous outcome variable, uses even fewer observations (the sibling pairs for whom the outcome differs). The estimates that we report are therefore based on the 'linear probability model', as it does not have this feature. (Estimates from conditional logit and linear probability models were similar when comparable.)

Also, the exclusion of individuals from one-child families means that one cannot derive an explicit estimate of  $\beta$  separately for this group: in effect, one must assume that the same process applies to them as for individuals with siblings. Another feature of sibling difference models is that estimates of the effects of any observed variable that has the same value for each sibling cannot be identified – these influences also get eliminated by the differencing procedure. (This does not arise with level regressions.) An example is mother's highest educational qualification (part of  $X$ ).

### **Non-parametric methods**

The final set of estimators is inspired by research on social experiments in which one investigates the effect of a given 'treatment' on an outcome. In our case, family structure is the treatment variable and we have a number of dichotomous outcome variables – for example, achieving *Abitur* or higher educational qualification, or being in poor health or unemployed. What we are interested in is the 'treatment effect' of family structure on each outcome – ie the difference between the probability that a young adult would achieve the outcome if they grew up in a non-intact family, for example, and the probability that the same young adult would achieve the outcome if, instead, they grew up in an intact family.

The problem is that, with non-experimental survey data like the SOEP, we do not know what the counterfactual outcomes are – what would have happened to the young adult who grew up in a non-intact family if they had in fact grown up in an intact family or, similarly, what would have happened to the young adult who grew up in an intact family if they had grown up in a non-intact family.

Parametric regression models, combined with various assumptions about the intergenerational transmission mechanism, are one way of getting round this problem, as explained earlier. Alternatively, one might ask how much can be said about treatment effects in the absence of any parametric specification or assumptions about the transmission mechanism. Using the method proposed by Manski (1995), we consider what bounds may be put on the treatment effect. The method works as follows (we draw on the detailed exposition of Ermisch et al, 2004).

Each of the two probabilities used to define the treatment effect (the probability of attaining the outcome if treated, and the probability of attaining the outcome if not treated) can be written as the sum of two terms, each of which is the product of a conditional probability and an unconditional probability. Within each sum, one of the constituent conditional probabilities cannot be observed in survey data (for the reasons explained earlier) but, because they are probabilities, each of them must lie between zero and one. Substituting these extreme values for the unobserved conditional probabilities allows one to put an upper bound and a lower bound on the probability difference that defines the treatment effect.

These upper and lower bounds represent the limits between which the treatment effect – the non-parametric counterpart to  $\beta$  – must lie. In principle, the treatment effect may lie between  $-1$  and  $1$  (because it is defined as a difference between two probabilities), ie of width 2. The bounds implied by Manski's method can be shown to have width 1, a substantial reduction. On the other hand, the bounds also include 0, and so the method does not put bounds on the sign of the treatment effect. (For example, they do not allow us to say whether the impact of growing up in a non-intact family has a positive or

negative effect on attainment.) This is not very informative, especially if zero lies near the middle of the range defined by the bounds.

To tighten the bounds on the treatment effect, one can estimate them separately for groups of individuals with similar characteristics. In our analysis, we use 96 groups defined by age, year of birth, sex, and mother's educational qualifications and age at the individual's birth. This provides us with 96 sets of upper and lower bounds. Of particular interest, and what we report, are estimates of the largest lower bound and the smallest upper bound (and their standard errors). The difference between these estimates is at most equal to one but may be smaller. This tightening of the bounds has the potential to provide a better indication of what the treatment effect is (Ermisch et al, 2004), as long as the relevant bounds are relatively precisely estimated (precision is related to the number of groups used and hence within-group sample numbers).

This completes our discussion of methods. The next two chapters discuss the estimates derived from using them, starting with the case of educational attainments.

## 4 Do differences in family structure during childhood affect educational attainments?

We have derived a large number of estimates corresponding to the different combinations of outcome measure, family structure measure, type of estimation method and sample. In the interests of brevity, our strategy is to focus initially on one outcome measure and one sample – highest educational qualifications for the West German sample – and to discuss the results for all the different measures of family structure and different estimation methods in this case in detail. The same format for reporting results is then used for the other samples and other outcome measures, but we do not discuss the estimates in such detail.

### Highest educational qualification, West German sample

Table 4 shows the estimates of three measures of childhood family structure on the probability of having achieved educational qualifications to *Abitur* level or higher. Standard errors are shown in parentheses underneath the estimates to which they refer. Panel A of the table refers to estimates for the most straightforward measure – ie whether ‘ever lived in a non-intact family’ – whereas Panels B and C refer to estimates for measures that distinguish between the type of non-intact family and the childhood stage at which this was experienced. There are estimates corresponding to each of the methods used: Manski’s bounds and parametric level and sibling difference regressions. Three sets of explanatory variables, labelled (1)–(3), were used in the level regressions: a basic specification plus two others that also incorporated household income and mothers’ work experience. See the note to Table 4 for details.

Consider first the effects of having ever lived in a non-intact family (Panel A). The estimate of the largest Manski lower bound is  $-0.091$  and of the smallest Manski upper bound is  $0.100$ . It is difficult to derive clear-cut conclusions because the bounds are imprecisely estimated (the ratio of each bound estimate to its standard error is less than two in both cases). The imprecision in estimation is a consequence of trying to get tighter bounds by taking account of differences in observable characteristics (see Chapter 3): the more subgroups that we use, the smaller the sample size within each of them.

Each of the three level estimates is relatively precisely estimated, and each indicates that family structure has an adverse effect on the probability of achieving this outcome, other things being equal. The estimated marginal effects of family structure are relatively large too. For example, according to specification (1) with the basic set of explanatory variables, living in a non-intact rather than intact family reduces the probability of attaining the *Abitur* or higher qualifications by about 15 percentage points. This is relatively large by comparison with the sample proportion of individuals who have achieved this level – 28.6%. Observe that the magnitude of the marginal effect declines slightly as additional

**Table 4**  
**Non-intact family structure and educational qualifications to *Abitur* or higher, West German sample**

	Manski's bounds		Level estimates (logit regressions)			
	Largest lower bound	Smallest upper bound	Base set of regressors (1)	As (1) plus household income (2)	As (2) plus maternal work experience (3)	Sibling difference estimates (linear probability model)
<b>Panel A</b>						
Ever lived in a non-intact family	-0.091 (0.090)	0.100 (0.096)	-0.152 (0.029)	-0.119 (0.040)	-0.095 (0.042)	-0.107 (0.088)
<b>Panel B</b>						
Lived with non-married mother	-0.091 (0.090)	0.200 (0.131)	-0.172 (0.039)	-0.137 (0.052)	-0.119 (0.056)	-0.173 (0.125)
Parents divorced	-0.143 (0.092)	0.142 (0.133)	-0.158 (0.034)	-0.135 (0.045)	-0.114 (0.047)	-0.113 (0.113)
Father died	-0.083 (0.082)	0.250 (0.214)	-0.085 (0.063)	-0.022 (0.094)	0.014 (0.103)	0.157 (0.229)
<b>Panel C</b>						
Ever lived in a non-intact family, and						
Child's age 0–5	-0.091 (0.083)	0.300 (0.143)	-0.169 (0.034)	-0.118 (0.047)	-0.093 (0.050)	-0.100 (0.096)
Child's age 6–10	-0.074 (0.049)	0.077 (0.073)	-0.138 (0.049)	-0.074 (0.068)	-0.051 (0.073)	-0.098 (0.125)
Child's age 11–16	-0.083 (0.078)	0.077 (0.073)	-0.114 (0.048)	-0.142 (0.057)	-0.124 (0.061)	-0.132 (0.139)

Notes: Standard errors are shown in parentheses. Level estimates are marginal effects computed at the average values of the explanatory variables. Base set of regressors for level regressions includes age (grouped), sex, year of birth, mother's highest educational attainment, mother's age at the child's birth, whether the respondent is an only child, number of brothers and sisters, birth order, region, a time trend and a constant. Specifications (2) and (3) also include the average income during childhood years; specification (3) also includes the number of years mothers were full-time and part-time employed during respondents' childhood years. Regressors in sibling difference models include differences in sex, age, mother's age at the child's birth, whether the respondent is the first born and a constant. Manski's bounds were estimated for 96 groups based on individual's age (<22, 22–25, 26–30, 31+), sex, mother's highest educational attainment (whether mother has *Abitur* or higher educational degree, or less than *Abitur*), mother's age at the child's birth (<24, 24+) and year of birth (before 1971, 1971 and later). Bootstrap standard errors for Manski's bounds were obtained using 500 bootstrap replications. Sample proportion with *Abitur* or higher qualifications is 0.359.

control variables are added to the specification. But, even when both household income during childhood and mother's work experience are included as regressors (specification [3]), the marginal effect is still relatively large – a reduction of 10 percentage points. These large effects are, of course, consistent with the raw association reported in Chapter 3.

For the reasons discussed in the previous chapter, however, the level estimates cannot be taken as conclusive because they are founded on strong identification assumptions. More tenable are the weaker assumptions underlying a sibling difference model. Although the estimate of the family structure effect is much the same as for the final levels regression – a reduction of 10 percentage points – it is imprecisely estimated. We cannot reject the null hypothesis that the family structure effect is equal to zero. Put another way, the 95% confidence interval within which the estimate lies is very wide – between  $-0.28$  and  $0.07$  – and so the data are consistent with a negative, zero or a positive effect. Observe also that level regressions indicate that effects differ by number of siblings and birth order (see discussion of Table 7 later), reminding us that sibling difference estimates are based only on families with more than one child. Overall, therefore, there is mixed evidence concerning whether there is an adverse impact of living in a non-intact family during childhood.

Next we investigated whether results differed if we took account of the type of non-intactness and its timing. As it happens, the results echoed the earlier ones in almost every way: see Panels B and C of Table 4. Again, the Manski bound estimates yield inconclusive results, level regressions indicate adverse effects of some aspects of family structure, and the sibling difference regressions provide estimates that are not significantly different from zero. The level estimates in Panel B suggest that it is experience of life with an unmarried mother or a divorced mother that has the adverse effects on educational attainment. Death of a father appears not to have any statistically significant effects, although this may reflect the relatively small cell sizes involved. Once we move to the sibling difference models, however, none of the three types of non-intactness is significantly associated with achievement of the outcome. (Reassuringly, however, the estimates themselves have the same pattern). The Panel C results show no clear variation in the impact of living in a non-intact family according to its timing by childhood stage (for example, they are not obviously larger at the youngest stage relative to the others.). As with Panel B, all the level estimates are negative and most of them are statistically significant; the sibling difference estimates are negative but not statistically significant.

It appears that derivation of statistically reliable results is constrained by relatively small cell sizes, once we try to go beyond the ‘ever lived in a non-intact family’ measure. To illustrate this point further, observe that we also tried to derive estimates using measures of family structure that summarise not only how non-intactness arose but also how it finished (if it did) – ie we took account of potential differences between children whose mother (re)married and those whose mother did not. The cell size problem was even greater in this case, and so we cannot report the results.

Instead, we now consider family structure measures based on the duration of paternal absence rather than its simple occurrence. Panel A of Table 5 reports estimates of the effect of the proportion of childhood spent in a non-intact family, whereas Panel B provides separate estimates for the time spent in different types of non-intact family. Because these explanatory variables are not dichotomous, we cannot apply the Manski bounds approach to them. Therefore only level and sibling difference estimates are shown.

The estimates suggest that the length of time spent in a non-intact family has no significant association with the probability of achieving *Abitur* or higher qualifications. To be sure, specification (1) of the level estimates indicates that longer spells are adversely associated with outcomes. (The magnitudes of the effect are relatively small. The

**Table 5**  
**Proportion of childhood in non-intact family and educational qualifications to *Abitur* or higher, West German sample**

	Level estimates (logit regressions)			
	Base set of regressors (1)	As (1) plus household income (2)	As (2) plus maternal work experience (3)	Sibling difference estimates (linear probability model)
<b>Panel A</b>				
Proportion of childhood lived in a non-intact family	-0.257 (0.077)	-0.108 (0.094)	-0.050 (0.094)	-0.042 (0.153)
<b>Panel B</b>				
Proportion of childhood lived with non-married mother	-0.191 (0.121)	-0.066 (0.139)	-0.009 (0.144)	-1.061 (0.498)
Proportion of childhood lived with divorced mother	-0.329 (0.099)	-0.199 (0.115)	-0.144 (0.113)	-0.118 (0.170)
Proportion of childhood lived with widowed mother	-0.172 (0.186)	0.136 (0.240)	0.219 (0.247)	0.695 (0.368)

Notes as for Table 4. Sample proportion with *Abitur* or higher qualifications is 0.359.

estimates imply that the difference between spending none and half of childhood in a non-intact family – a large difference – reduces the probability of achieving the outcome only by about nine percentage points, other things being equal.) In any case, the effect evaporates once additional explanatory variables are added to the specification; observe, too, how the magnitude of the estimate declines substantially. This pattern is easily explained. The length of time spent in a non-intact family is likely to be negatively correlated with family income and maternal work experience. If one does not control for the latter two influences, then they will be reflected (spuriously) in the estimate for duration. The sibling difference estimate is also not significantly different from zero.

In sum, whether one can say with confidence that there is an impact of family structure on the probability of achieving *Abitur* or higher qualifications for members of the West German sample depends on the method one uses to estimate the effect. Many of the level regression estimates suggest that there is an adverse impact of growing up in a non-intact family. In principle, these estimates have less credibility than those derived from using sibling difference models and, according to the latter, there is no statistically significant impact of family structure.

## Highest educational qualification, Guestworker and East German samples

We now consider whether these conclusions also apply to members of the Guestworker and East German samples. For brevity, we only consider two measures of family structure (whether ever lived in a non-intact family, and differentiating the type of non-intact family). The results are shown in Table 6. Despite the marked differences in family structure and educational attainment between the three samples (see Chapter 2), the pattern of estimates for the Guestworker and East German samples is similar to that for the West German one.

**Table 6**  
Family structure effects on educational qualifications to *Abitur* or higher, Guestworker and East German samples

	Manski's bounds		Level estimates (logit regressions)			
	Largest lower bound	Smallest upper bound	Base set of regressors (1)	As (1) plus household income (2)	As (2) plus maternal work experience (3)	Sibling difference estimates (linear probability model)
<b>Guestworker sample</b>						
Ever lived in a non-intact family	-0.111 (0.104)	0.500 (0.236)	-0.089 (0.034)	-0.088 (0.035)	-0.080 (0.035)	-0.003 (0.104)
Lived with non-married mother	-0.103 (0.055)	0.535 (0.090)	-0.119 (0.036)	-0.118 (0.036)	-0.119 (0.033)	-0.225 (0.106)
Parents divorced	-0.045 (0.044)	0.500 (0.180)	-0.091 (0.045)	-0.090 (0.045)	-0.071 (0.049)	-0.074 (0.097)
Father died	-0.154 (0.058)	0.546 (0.106)	0.017 (0.122)	0.017 (0.123)	0.016 (0.125)	-0.109 (0.249)
<b>East German sample</b>						
Ever lived in a non-intact family	-0.136 (0.067)	0.200 (0.182)	-0.118 (0.049)	-0.092 (0.054)	-0.095 (0.053)	0.037 (0.176)
Lived with non-married mother	-0.148 (0.065)	0.154 (0.098)	-0.172 (0.050)	-0.152 (0.054)	-0.154 (0.053)	
Parents divorced	-0.235 (0.075)	0.200 (0.183)	-0.062 (0.061)	-0.037 (0.073)	-0.040 (0.072)	n.a.
Father died	-0.179 (0.063)	0.571 (0.185)	0.048 (0.168)	0.073 (0.154)	0.056 (0.153)	

Notes as for Table 4. Sample proportion with *Abitur* or higher qualifications is 0.191 (Guestworker sample) and 0.325 (East German sample). n.a.: cell sizes too small to derive estimates.

Compare, for example, the estimates for ‘ever lived in a non-intact family’ across the samples. For the Guestworker sample, virtually all of whom live in the former West Germany, the level regression specification (3) yields a precisely estimated marginal effect of  $-0.08$ , which is very similar to the corresponding West German sample estimate of  $-0.10$  (Table 4, Panel A), especially when one notes that the regressor mean values used to compute the effects differ between the samples (Table 3). By contrast, the corresponding estimate for the East German sample is similar ( $-0.10$ ) but less precisely estimated. According to the sibling difference estimates, and as was the case for the West German sample, we cannot reject the null hypothesis that there is no effect on the probability of achieving *Abitur* or higher qualifications of growing up in a non-intact family.

We also explored the consequences of differentiating between the different types of non-intact family. An interesting contrast with the West German sample results is that the impact of non-intactness appears to be associated primarily with living with a non-married mother (ie living with a divorced mother is relatively less important). Note the level specification (3) estimate of  $-12\%$  for Guestworker sample members, and  $-15\%$  for East German sample members. The sibling difference estimate for the former group is even larger ( $-23\%$ ) and statistically significant as well. (Cell sizes were too small for the East German sample and so results are not reported.)

### **The effects of other factors on the probability of achieving *Abitur* or higher educational qualifications**

The conclusion emerging is that we cannot state with confidence that family structure has a causal effect on the probability of achieving *Abitur* or higher educational qualifications. If family structure does not have an effect, then what does? To help answer this question, we report marginal effect estimates for the other variables besides ‘ever in a non-intact family’ that were used as explanatory variables in the level and sibling difference regressions reported in Table 4, Panel A, for each sample – see Table 8. There are some gaps in sibling difference columns reflecting the fact that estimates cannot be derived for variables that have the same value for siblings from the same family (for example, maternal educational qualifications). Where there are estimates from both level and sibling difference regressions, the effects are broadly similar, and so we focus discussion on the levels estimates (but noting some exceptions where relevant).

For the West German and Guestworker samples, it is apparent that the probability of achieving *Abitur* or higher qualifications is higher for those aged 22+ than for younger individuals. (In part this may simply represent the fact that it takes time to acquire these qualifications – which is why we control for it.) For the East German sample, the opposite is the case according to the level estimates, perhaps reflecting the depreciation among the older age groups of skills that were more relevant in the pre-reunification German Democratic Republic (GDR). The East German sample is also distinctive because it is the only sample for which gender matters for educational attainment. Compared to young men, young women are more likely to have the *Abitur* or higher qualifications (although this effect is not significant according to the sibling difference regression).

Being an only child appears not to affect attainment probabilities in any of the samples but, among those with siblings, birth order and number of siblings have heterogeneous impacts across the samples. For example, the coefficients on the number of brothers and sisters are negative for all samples, but both are statistically significant only for the Guestworker sample, and much the same size in this case. On the other hand, for this sample, birth order has no significant effects on attainment, whereas there are adverse effects of being higher born for the West and East German samples. (For both samples, the sibling difference regression estimates are not statistically significant, which may reflect a small sample problem.)

The impact of household income is not clear-cut across the samples. Although the level estimates indicate that having a higher income raises attainment probabilities, none of the sibling difference estimates are statistically significant.

What is the influence of the individual's mother's characteristics? The level estimates indicate that achievement probabilities were higher for those with older mothers. What is more obviously important is the mother's own educational qualifications. For the West German sample, the more highly qualified the mother, the more likely her child is to have the *Abitur* or higher qualifications. For the East German sample, there is a similar educational gradient, although the advantage conferred from having some qualifications rather than none is less than for the West German sample. By contrast, for the Guestworker sample, the only distinct advantage is associated with a mother having *Abitur*-level qualifications herself. The mixed results for this sample may reflect genuine heterogeneity in the way in which the educational qualifications that the mothers gained (perhaps outside Germany) were treated in Germany. Alternatively, the results might reflect misclassification errors made by us when attempting to create a comparable set of qualification categories. Once we control for maternal education, the longer that a mother was employed during childrearing appears to be associated with lower attainment probabilities for the West German and Guestworker samples, although the picture is much less clear-cut according to the sibling difference estimates.

Which factors appear to have the largest impact on the probability of having the *Abitur* or higher qualifications? To answer this, we can simply compare the marginal effects because virtually all the explanatory variables (that are statistically significant) are dichotomous. Inspection of Table 7 reveals that two factors stand out as having relatively large positive effects on attainment probabilities for all three samples: the age of the individual, and having a mother with better educational qualifications (less so for the Guestworker sample). These are hardly surprising results (and consistent with previous literature), but are worth reiterating in order to underline the relatively inconclusive results about whether the effects of family structure on attainment are causal or not.

One obvious response to the inconclusive-effect finding is that we have focused attention on only one outcome. It is therefore time to consider our results for different outcome measures.

**Table 7**  
**Educational qualifications to *Abitur* or higher: effects other than ‘living in a non-intact family’**

	West German sample		Guestworker sample		East German sample	
	Level estimates	Sibling difference estimates	Level estimates	Sibling difference estimates	Level estimates	Sibling difference estimates
Age 22–25	0.281 (0.057)	0.144 (0.050)	0.201 (0.059)	0.199 (0.054)	0.030 (0.090)	0.273 (0.139)
Age > 25	0.334 (0.086)	0.179 (0.067)	0.232 (0.102)	0.304 (0.070)	–0.005 (0.159)	0.494 (0.276)
Year of birth	0.007 (0.008)		0.009 (0.007)		–0.024 (0.023)	
Female	–0.003 (0.030)	–0.043 (0.035)	0.015 (0.026)	0.046 (0.038)	0.122 (0.047)	0.013 (0.085)
Only child	–0.034 (0.056)		–0.054 (0.053)		–0.084 (0.069)	
Number of brothers	–0.031 (0.023)		–0.056 (0.015)		–0.106 (0.047)	
Number of sisters	–0.060 (0.024)		–0.053 (0.018)		–0.073 (0.052)	
<b>Birth order:</b>						
Second child	–0.130 (0.032)	–0.060 (0.043)	0.047 (0.034)	0.057 (0.048)	–0.249 (0.049)	–0.022 (0.137)
Third child or more	–0.222 (0.042)	–0.023 (0.085)	0.026 (0.049)	0.084 (0.079)	–0.168 (0.073)	0.177 (0.290)
Average income during childhood	0.004 (0.001)	0.004 (0.003)	0.002 (0.001)	0.0003 (0.003)	0.005 (0.002)	–0.0001 (0.007)
Mother’s age at birth	0.012 (0.003)	–0.003 (0.011)	0.002 (0.003)	0.016 (0.010)	0.031 (0.007)	0.031 (0.056)
<b>Mother’s highest education:</b>						
Intermediate school certificate	0.261 (0.042)		–0.047 (0.049)		0.210 (0.086)	
Grammar school certificate ( <i>Abitur</i> )	0.382 (0.102)		0.329 (0.159)		0.317 (0.168)	
University or technical college degree	0.566 (0.045)		0.093 (0.107)		0.446 (0.109)	
No. years mother part-time employed	–0.006 (0.003)	0.006 (0.013)	–0.002 (0.004)	–0.005 (0.018)	0.004 (0.010)	–0.024 (0.059)
No. years mother full-time employed	–0.011 (0.003)	0.001 (0.013)	–0.007 (0.002)	0.010 (0.012)	0.006 (0.010)	0.063 (0.040)

## Do the results differ for the probability of *Gymnasium* attendance?

One possible explanation for the lack of sizeable effects is that the outcome examined so far – the probability of achieving *Abitur* or higher qualifications – is measured at an age that is too distant in the future with respect to the time in which any family disruption occurred. A number of studies by developmental psychologists and sociologists have found that parents and children gradually adjust to divorce, with parents' childrearing skills improving and parental conflict tapering off over time (Amato, 1993). If this is the case, children's well-being will improve with the passage of time since the divorce, and we would expect to observe inferior outcomes concentrated at (early) stages of life closer to the time of family breakdown. In this section, we analyse educational outcomes that are typically observed before people's highest educational achievement can be measured – namely, whether their school track at age 14 is the *Gymnasium* or not. Observe that family structure changes are now measured over ages 0–14 rather than ages 1–16 as before, reflecting the earlier measurement of the outcome variables.

The results for *Gymnasium* attendance are displayed in Table 8, derived from level regressions (specification [3]) and sibling difference regressions. Panel A shows the estimated effects of ever living in a non-intact family. Interestingly, there are no statistically significant effects apparent for the Guestworker and East German samples, but the sibling difference model for the West German sample indicates a statistically significant negative association. The estimated effect of having lived in a non-intact family is relatively large – a reduction of some 15 percentage points – which may be compared with the sample average proportion in this school track of 37.8%. The rest of the table reflects our efforts to try and find out more about how this effect operates.

Variations in the effect by type of non-intactness are explored for the West German sample in Panel B of Table 8. (Given the lack of significant effects, no corresponding estimates are reported for the other two samples.) The sibling difference estimates indicate large adverse effects for children whose parents divorced (marginal effect –24 percentage points) and, especially, for those whose father died (marginal effect –54 percentage points). We are inclined to discount the magnitude of the latter result on the grounds that it may be an artefact of relatively small cell sizes. Panel C explores instead how the effect of living in a non-intact family varies with its timing by childhood stage. The sibling difference estimates indicate much larger adverse effects for non-intactness if it occurred after age 5 rather than before age 5. (The pattern is much more homogeneous according to the level estimates.) In analysis not reported here, we also investigated how effects vary with the combination of type and timing of non-intactness. Results are not reported because of small cell size problems.

The estimated effect of variations in the duration of non-intactness are shown in Table 8, Panel D. As it happens, the effects are not statistically significant according to either the level or sibling difference regressions.

**Table 8**  
**Gymnasium attendance and family structure, by sample**

	West German sample		Guestworker sample		East German sample	
	Level estimates	Sibling difference estimates	Level estimates	Sibling difference estimates	Level estimates	Sibling difference estimates
<b>Panel A</b>						
Ever lived in a non-intact family	-0.067 (0.042)	-0.150 (0.070)	-0.049 (0.031)	0.048 (0.078)	-0.079 (0.048)	0.008 (0.094)
<b>Panel B</b>						
Lived with non-married mother	-0.073 (0.064)	-0.027 (0.090)				
Parents divorced	-0.087 (0.052)	-0.242 (0.100)	n.a.		n.a.	
Father died	0.043 (0.108)	-0.543 (0.200)				
<b>Panel C</b>						
Lived in non-intact family, and						
Child's age 0–5	-0.065 (0.051)	-0.093 (0.073)				
Child's age 6–10	-0.084 (0.066)	-0.242 (0.098)	n.a.		n.a.	
Child's age 11–14	-0.041 (0.088)	-0.376 (0.112)				
<b>Panel D</b>						
Proportion of childhood lived in a non-intact family	-0.095 (0.092)	0.013 (0.120)				

Regression specifications are as described in the notes to Table 4 (specification [3] for the level estimates, linear probability models for the sibling difference estimates). Sample proportion with *Gymnasium* attendance at age 14 is 0.359 (West German sample), 0.165 (Guestworker sample) and 0.414 (East German sample). n.a.: cell sizes too small to derive estimates.

## Discussion

Our results concerning the effect of family structure on the probability of achieving *Abitur* or higher qualifications can be summarised briefly: we cannot conclude unambiguously that there is an effect. Although there are some effects for some measures of family structure according to the level estimates, the sibling difference estimates are imprecisely estimated. The sibling difference estimates are consistent not only with the adverse effect implied by the level estimates, but also with there being no effect at all.

Conclusions are more easily drawn when we consider family structure effects on the probability of attending *Gymnasium* at age 14. For this outcome, and for the West German sample (and only this one), there appears to be a marked adverse effect of growing up in a non-intact family.

How can we reconcile the different results for the different outcomes? One explanation has already been offered – ie for child development reasons, we might expect inferior outcomes to be concentrated at stages of life that are closer to the time of family breakdown (see earlier) and, of course, age 14 is before the age at which we measure highest educational qualification (after 19 at least and usually much later). It may be that the *Gymnasium* system (and, afterwards, the university system) equalises opportunities for children of different backgrounds in such a way that any initial disadvantage in terms of *Gymnasium* access may be eroded with the passage of time.

Nonetheless, a puzzle appears to remain because, in Germany, the only route in all but a few cases to getting the *Abitur* and a university degree is by attending a *Gymnasium* – that is, the *Abitur* is the *Gymnasium* school-leaving certificate, and also functions as the principal entry qualification for higher education. In short, one might expect that, if children from non-intact families are at a disadvantage in terms of getting into the *Gymnasium*, one would also expect this disadvantage to be reflected in subsequent attainments that are contingent on *Gymnasium* attendance.

Our explanation for the results is related to details of the German education system that we have glossed over until now. First, it is possible to get the *Abitur* if you do not attend the *Gymnasium* at age 14: there are a (small) number of individuals who switch from other school tracks to the *Gymnasium* after that age and then get the *Abitur*. Second, some tertiary degree courses (for example, at the *Fachhochschule*) can be taken without having an *Abitur*, and we count getting a *Fachhochschule* degree as achievement of 'Abitur or higher qualification'. Our sample for analysis of *Gymnasium* attendance at age 14 did not include the switchers to the *Gymnasium* in that category (and those attending school tracks other than *Realschule*, *Hauptschule* and *Gymnasium* were not included at all). Hence, the samples used for the analysis of the two outcomes are different. What is also relevant to reconciliation of the results about family structure for the two outcomes is whether the switchers between school tracks were more likely to experience living in a non-intact family during childhood. Our investigations suggest that this is the case, although the small number of switchers makes it difficult to draw unambiguous conclusions.

## 5 Does growing up in a non-intact family affect health and labour market outcomes?

In this chapter, by considering health and labour market outcomes, we continue our examination of whether family structure effects differ according to the outcome of interest. For brevity's sake, we report estimates for only one measure of family structure – namely, whether the individual ever lived in a non-intact household during childhood. The estimates for health outcomes are shown in Table 9 and for labour market outcomes in Table 10. Each table has a similar structure, corresponding to Table 4 (Panel A in particular) in the previous chapter. For each outcome, there are three level estimates (corresponding to whether or not income and maternal work experience are included in regressions) plus a sibling difference estimate.

### Health outcomes

The two health outcome measures are whether the individual is currently a smoker, and whether they assess themselves to be in poor health. The first substantive conclusion that we draw from Table 9 is that being in poor health is not determined by whether someone lived in a non-intact family during childhood. The sign of the estimated effect is positive in all but one case across the three samples – as expected – but the effect is never statistically significant. The fact that the measure is self-assessed and also a description of 'current health' may explain this.

By contrast, there is a marked impact of family structure on whether someone is currently a smoker, for all three samples and for both estimation methods. For example, according to the sibling difference estimates for the West German sample, ever living in a non-intact family is associated with a 13 percentage point increase in the probability of smoking. This is relatively large compared to the benchmark of the proportion in the sample that smokes (36%). Among the Guestworker sample, the family structure effect is larger in magnitude – 22 percentage points – but the number who smoke is also larger (41% of the sample). Among the East German sample, the effect is distinctly smaller – 11 percentage points – particularly noting that the proportion of the sample that smoke is 43%, but it is not negligible.

These results suggest unambiguously that experience of living in a non-intact family is causally linked with higher smoking propensities. What the results do not shed light on is the precise mechanism underlying the effect. It might, for example, be the stress associated with life in a lone-parent family that leads individuals to seek relief via nicotine. In future research, and subject to data availability, we aim to investigate whether a family structure effect remains once one controls for whether or not the individual's mother smokes. This check may be informative about whether the effect

**Table 9**  
**Ever lived in a non-intact family and health outcomes, by sample**

	Level estimates			
	Base set of regressors (1)	As (1) plus household income (2)	As (2) plus maternal work experience (3)	Sibling difference estimates
<b>West German sample</b>				
Smoker	0.148 (0.033)	0.147 (0.036)	0.131 (0.037)	0.129 (0.046)
In poor health	0.007 (0.010)	0.010 (0.011)	0.004 (0.009)	-0.021 (0.017)
<b>Guestworker sample</b>				
Smoker	0.198 (0.072)	0.199 (0.075)	0.198 (0.076)	0.222 (0.079)
In poor health	0.018 (0.017)	0.009 (0.016)	0.007 (0.016)	0.029 (0.026)
<b>East German sample</b>				
Smoker	0.148 (0.039)	0.187 (0.046)	0.187 (0.047)	0.114 (0.053)
In poor health	0.015 (0.009)	0.025 (0.012)	0.022 (0.012)	0.008 (0.021)

Regression specifications (1)–(3) as described in the note to Table 4. Sibling difference estimates derived from linear probability model, level estimates from logit regressions.

found here reflects a trait of lone mothers that is transmitted to their children, or reflects something about lone parenthood itself that affects children directly.

## Labour market outcomes

The three labour market outcome measures are whether or not an individual is registered unemployed, whether they currently live in a household that is receiving social assistance, and (for full-time employees) real monthly labour earnings. The estimates are shown in Table 10, in the same format as Table 9.

We find that, for the Guestworker sample, there are no statistically significant effects of family structure on any of the three outcomes. In fact, there are no effects on earnings or on the probability of being registered unemployed either, for all three samples.

The one clear-cut result concerns the effect of family structure on the probability of receipt of social assistance benefit in West Germany. Not only do all three level estimates suggest that there is a positive and statistically significant impact, so too does the sibling

difference estimate. The latter can be interpreted as indicating that living in a non-intact family during childhood is associated with a four percentage point increase in the probability of social assistance receipt, other things being equal. This is a large effect, given that the sample proportion in receipt is 2.8%.

As with the effect on smoking propensities discussed previously, the existence of the effect on social assistance receipt is not informative about the underlying mechanisms. We refer readers to Siedler (2004) for a more detailed study of intergenerational transmission process and the determinants of social assistance receipt using the same dataset as here, and a review of other previous research on the topic (primarily referring to the USA rather than Germany). Siedler also examined whether the estimates were sensitive to the nature of the sample used. Using a sample similar to ours, he found an effect – as we have – although only for daughters and not sons. And the effect was also found if analysis was restricted to individuals who did not live with their parents, or if analysis was restricted to individuals who were older than 23 years.

**Table 10**  
**Ever lived in a non-intact family and labour market outcomes, by sample**

	Level estimates			
	Base set of regressors (1)	As (1) plus household income (2)	As (2) plus maternal work experience (3)	Sibling difference estimates
<b>West German sample</b>				
Unemployment	0.004 (0.011)	-0.007 (0.012)	-0.005 (0.012)	-0.063 (0.034)
Receipt of social assistance	0.032 (0.006)	0.018 (0.005)	0.020 (0.006)	0.039 (0.009)
Earnings	-0.081 (0.055)	-0.017 (0.065)	-0.033 (0.067)	0.159 (0.096)
<b>Guestworker sample</b>				
Unemployment	0.014 (0.031)	-0.005 (0.027)	-0.023 (0.025)	0.018 (0.129)
Receipt of social assistance	0.008 (0.011)	0.002 (0.011)	0.004 (0.012)	0.009 (0.018)
Earnings	0.038 (0.056)	0.022 (0.064)	0.026 (0.063)	0.049 (0.112)
<b>East German sample</b>				
Unemployment	0.040 (0.044)	0.159 (0.105)	0.194 (0.142)	-0.002 (0.237)
Receipt of social assistance	0.027 (0.009)	0.039 (0.015)	0.041 (0.014)	0.003 (0.016)
Earnings	0.004 (0.052)	0.019 (0.079)	-0.001 (0.081)	-0.023 (0.129)

Regression specifications (1)–(3) as described in the note to Table 4. Sibling difference estimates derived from linear probability model, level estimates from logit regressions.

## 6 Summary and conclusions

### Summary

In this report, we have aimed to fill gaps in the evidence base for Germany about how differences in the socioeconomic attainments of young adults relate to differences in their family background – in particular, differences in the family structure that they experienced during childhood. We have tried to go behind the raw associations between family structure and attainments to unravel genuinely causal effects. The SOEP is a rich longitudinal dataset that is well suited for this task. We have taken care to examine the robustness of our results by comparing estimates derived from using different statistical methods, and also examining whether effects differ according to outcome, definition of family structure during childhood, and socioeconomic and cultural environment in so far as this is represented by membership of West German, Guestworker and East German samples. The results are summarised in Table 11.

For educational attainments, we have two main substantive findings. First, according to the level estimates, the chances of achieving *Abitur* or higher educational qualifications are adversely affected by ever living in a non-intact family during childhood for the individuals belonging to the West German and Guestworker samples. However, once the effects of unmeasured family influences are taken account of, using a sibling difference estimator, this conclusion is no longer so clear-cut: we cannot say for sure that there are adverse family structure effects. Although the estimate of the effect was much the same as the level estimate, we cannot be certain that the result does not reflect the effects of unmeasured family differences rather than be wholly due to differences in family structure. (Hence the question mark added in Table 11.) On the other hand, the differences between the results may arise if the effects of family structure on educational attainments differ for only children compared to children with siblings. This is an example of a case in which conclusions depend on the statistical method used.

The results should not be interpreted to mean that family background has no effect on educational attainment. As we (and many others before us) have demonstrated, there are some strong impacts on attainment associated with observable parental characteristics, of which the positive impact of higher maternal educational qualifications is the prime example. Put another way, there are some factors for which we can say with confidence that their presence has a beneficial or adverse effect. Family structure is a factor for which we cannot.

The second finding is that, for members of the West German sample, living in a non-intact family during childhood has an adverse impact on whether the individual followed the *Gymnasium* secondary school track at age 14. These effects appear to be associated more with experience of divorce or death of father than with living with a lone mother, and to be largest at ages 6–14 rather than 0–5. In addition, the effect appears to be due to the occurrence of non-intactness rather than its duration. There are no similar effects for the Guestworker and East German samples (Table 11).

**Table 11**  
**The effect of ‘ever lived in a non-intact family’ on outcomes in Germany: summary**

<b>Outcome</b>	<b>West German sample</b>	<b>Guestworker sample</b>	<b>East German sample</b>
Has <i>Abitur</i> or higher qualification	Adverse?	Adverse?	–
Attended <i>Gymnasium</i> at age 14	Adverse	–	–
Currently a smoker	Adverse	Adverse	Adverse
In poor health	–	–	–
Registered as unemployed	–	–	–
Receipt of social assistance	Adverse	–	–
Earnings (if full-time employed)	–	–	–

‘Adverse?’: adverse effect according to level estimate but no statistically significant effect according to sibling difference estimate. ‘–’: effect not statistically significant according to both level and sibling difference estimates.

For the two health outcomes, and for all samples, we find no statistically significant impact of family structure on whether individuals reported themselves as being in poor health. However, consistently across all three samples and according to level and sibling difference estimates, individuals who ever lived in a non-intact family during childhood are more likely to be smokers, and hence at greater risk of having poor lifetime health.

Among the three labour market outcomes, we find that non-intactness had an adverse impact for only one outcome. Individuals from the West German sample who experienced life in a non-intact family were more likely to live in a household receiving social assistance. Unravelling the precise mechanisms driving the smoking and social assistance receipt results is an important task for future research.

### **Are there straightforward explanations for the cross-sample differences in results?**

We argued at the outset that having three different samples for Germany was useful for relating differences in estimated effects to the differences in socioeconomic and cultural environment represented by membership of those samples. As Table 11 clearly shows, there are some marked differences across samples. For example, the effects of family structure on *Gymnasium* attendance and social assistance receipt applied only to the West German sample. On the other hand, there are also examples of cross-sample similarities: in all three samples, growing up in a lone-parent family was associated with a greater probability of being a smoker, and in no sample was there an effect on being unemployed or in poor health.

Despite the heterogeneity of effects, it is tempting to say from inspection of Table 11 that living in a non-intact family during childhood has more adverse effects for the West German sample than for the other two samples. And this naturally leads to questions of

why that may be. As we controlled for differences in personal characteristics when deriving the estimates, the answers to questions about cross-sample differences presumably lie in differences in socioeconomic and cultural 'institutions' – for example, differences in education, labour markets, or social security systems, or in social and cultural norms and expectations, and so on. Furthermore, one might hope too that pairwise comparisons between samples would help expose the impact of these institutional differences – that is, one might wish to be able to attribute differences in effects between the West German and Guestworker samples to differences in social and cultural milieu, since the respondents to both samples grew up in the former West Germany (and so experienced similar socioeconomic institutions). Similarly, one might hope to attribute differences in effects between the West German and East German samples to differences in socioeconomic institutions (since all the respondents were native Germans).

Pursuing this line of argument, one potential explanation for the fact that there are apparently no adverse effects of growing up in a non-intact family for the East German sample (smoking excepted), whereas there are several adverse effects for the West German sample, is that in the former East Germany mother's labour force rates were relatively high and there was a widely accessible system of childcare; and that these factors neutralised any of the adverse consequences typically associated with lone parenthood (see Chapter 1). (The education systems were relatively similar.) There are two reasons why we hesitate to emphasise this explanation. First, it is an unresolved issue whether differences in results between our West German and East German samples truly reflect the influence of the different institutions of the former German Democratic Republic (GDR) and Federal Republic of Germany (FRG) or simply reflect some unmeasured time effects. Recall that our outcome data for the West German sample span the 1980s and 1990s, whereas those for the East German sample refer only to the post-Reunification 1990s. Second, and more generally, we are cautious about drawing such a conclusion on the basis of such caricature descriptions of institutional differences. Much more detailed comparative studies are required of the institutional differences and the particular mechanisms at work.

For similar reasons, we are cautious about drawing conclusions about why effects differ for the West German and Guestworker samples. In particular, native Germans and guestworkers probably did not face the same socioeconomic institutions – for example, there is likely to have been differences between groups in the types of schools attended and in labour market opportunities, even though both grew up in the former West Germany. Part of the analytical problem is that the key defining characteristics of socioeconomic institutions are difficult to measure quantitatively, or information about them is not available in household surveys.

Thus, although 'institutions matter', we cannot be confident about the details of the causal mechanisms at play. Additional complementary research is required to explain the cross-sample patterns that we have uncovered using secondary analysis of survey data. A final piece of evidence about the relevance of institutions is provided by the results for smoking: recall that growing up in a non-intact family has increased the probability of smoking for respondents of all three samples. Whether or not someone smokes is a choice that is much less likely than other outcomes to be influenced by the sorts of socioeconomic institutions that we have mentioned so far, and even by the nature of the healthcare system. Hence, it is less surprising that there is apparently an effect for all three samples.

## Is Germany different from other countries?

It is also interesting to ask how the results that we have found using German data compare with those for other countries. As noted in the Introduction, cross-national comparisons are plagued by problems related to use of differently defined measures and different methods. We therefore focus our discussion on the studies that are most closely comparable to ours – namely, those by Ermisch and Francesconi (2001a, 2001b) and Ermisch et al (2004) of the socioeconomic attainments of young adults in Britain. We have intentionally followed them in the way in which we have used within-panel survey parent-child linkages to undertake intergenerational analysis, and by using the same portfolio of statistical methods, similar measures of outcomes, family structure and sets of control variables.

The three outcome variables that are most comparable concern whether individuals have educational qualifications sufficient to satisfy university entry requirements, whether they are in paid employment and whether they smoke. Table 12 contains a summary comparison of findings from the 'Ermisch and Francesconi' research programme and the current one. We focus on the effect of 'ever living in a non-intact family' and use results from our West German sample in order to minimise institutional confounding effects.

In Britain, growing up in a non-intact family was found to have an adverse effect on the probability of having educational qualifications to university entry level, and on the probability of non-employment according to both level and sibling difference methods. By contrast, for (West) Germany, it is only the level estimates that indicate a significant adverse effect. According to the sibling difference estimates, we cannot reject the hypothesis that there is no effect for both outcomes. On the other hand, for both countries, experience of lone parenthood as a child is associated with a higher probability of being a smoker, regardless of the statistical method used.

This pattern of similarities and differences across nations in family structure effects has a parallel with the pattern of similarities and differences within Germany that we drew attention to earlier. The cross-national comparisons provide additional confirmation that

**Table 12**  
**The effect of 'ever lived in a non-intact family' on outcomes: Britain versus Germany**

Outcome	Britain		(West) Germany	
	Outcome measure	Effect	Outcome measure	Effect
Educational qualifications to university entry level	A-level or higher qualifications	Adverse	<i>Abitur</i> or higher qualification	Adverse?
Non-employment	Not employed or in full-time education or training, or caring	Adverse	Registered as unemployed	Adverse?
Smoker	Smokes 10+ cigarettes per day	Adverse	Currently a smoker	Adverse

'Ermisch and Francesconi' results for Britain refer to both level and sibling difference estimates in Ermisch and Francesconi (2001a) and Ermisch, Francesconi, and Pevalin (2004). Results for (West) Germany refer to our results for the West German sample. 'Adverse?': adverse effect according to level estimate but no statistically significant effect according to sibling difference estimate.

'institutions matter': there are differences between Britain and Germany for the two outcomes for which socioeconomic institutions are likely to matter most, and a similarity for the outcome for which they are likely to matter the least (smoking).

Education at all levels in Germany is state-provided and free of tuition charges, and there are no large differences in quality across schools of a given track (see, for example, Dustmann, 2004). By contrast, in Britain, private schooling is more prevalent, and there is greater variation in quality across school types. Britain's and Germany's welfare states also differ. Both are made up of a mixture of social assistance and social insurance programmes, but the mixture differs. In Britain, the emphasis is means-tested social assistance; in Germany there is greater emphasis on social insurance (including unemployment benefits, the payments of which are related to former earnings). Overall, the German welfare state is more comprehensive and generous than the British one (Daly, 2000; Jenkins et al, 2001). Another cross-national difference relates to child support. The British Child Support Agency is renowned for its ineffectiveness and, in general, receipt of child support payments from non-custodial parents is low. In Germany, the state offers support to custodial parents not only in terms of access to childcare services but also in strictly enforcing compliance in child support payments by non-custodial parents (Martiny and Schwab, 2002).

These differences may mitigate some of the potentially adverse impacts of growing up in a lone-parent family in Germany rather than Britain. But, clearly, crude characterisations of cross-national differences in institutions cannot provide a complete explanation – why do we not find clear-cut family structure effects for the probability of having *Arbitur* or higher qualifications, when we do find them for the probability of social assistance receipt?

The difficulty of appealing to simplistic welfare state 'regime'-type arguments to explain cross-national differences in the impact of childhood family structure on attainments is underlined by the recent research of Björklund et al (2004) comparing Sweden and the USA. The authors observe that one might expect family structure changes to have a potentially less adverse effect on outcomes in Sweden than in the USA because of the more comprehensive and generous social safety net in Sweden, and because '...social norms in Sweden have de-emphasized the importance of marriage as an institution' (2004: 1). And yet they find (using sibling difference models) that one cannot reject the hypothesis that there is no family structure effect on either the number of years spent in schooling or on the earnings of young people, in either country.

### **Policy implications**

Our findings provide several messages for policy makers: First, they cannot assume that growing up in a lone-parent family has a universally adverse impact on later-life outcomes. To be sure, in Germany – as in Britain and many countries – individuals who spent time in a lone-parent family during childhood have lower attainments than those who remained with both parents throughout childhood. But this does not mean that the differences in family structure caused the lower attainments. For some outcomes, they do; for others it appears that they may not. They may be caused by other factors that are associated with differences in family structure.

Second, and related, this means that policies to reduce the prevalence of lone parenthood, such as making divorce harder, will not have unambiguously positive or universal effects on later-life attainments (and 'forcing' parents to stay together may have other adverse consequences for children).

Third, although our results about the impact of family structure during childhood are not clear-cut, this does not mean that family background is not important for determining socioeconomic outcomes. Family background has many dimensions in addition to family structure, many which are not directly measurable. Our study has underlined the importance of these, as much previous research also has. (In Chapter 4, we drew attention to factors such as maternal educational qualifications, and Chapter 1 also referred to various types of unmeasured background factor.) Put another way, if the goal is to reduce inequalities in later-life attainments, it may be more effective for policy to target educational achievement rather than marriage.

Fourth, if our results provide any comfort for German policy makers, it is that the situation is apparently not as bad as in Britain where the effects of family break-up on later life attainments are more definitely adverse. However, German policy makers should not be sanguine. Our findings are that there is currently no unambiguous proof that growing up in a lone-parent family has adverse effects for later-life outcomes (with the exception of the effect on smoking). To reiterate: this does not mean that there is no effect. It means that the size and direction of the effect is not known for sure (for important statistical reasons). Indeed, our results are consistent with the effect being adverse.

Fifth, the experiences of different countries provide no simple diagnoses or obvious policy 'magic bullets' for reducing the harmful impacts of family break-up. Cross-national patterns are often explained with recourse to broad-brush descriptions of differences in welfare state regimes and other socioeconomic and cultural institutions. However, as discussed previously, these differences provide no straightforward explanation for differences between different groups within Germany, between Britain and Germany or, indeed, between Sweden and the USA.

## References

- Amato, P.R. (1993) 'Children's adjustment to divorce: theories, hypotheses, and empirical support'. *Journal of Marriage and the Family* 55(1): 23–38.
- Baum, C.L. II. (2003) 'Does early maternal employment harm child development? An analysis of the potential benefits of leave taking'. *Journal of Labor Economics* 21(2): 409–448.
- Biblarz, T.J. and Gottainer, G. (2000) 'Family structure and children's success: a comparison of widowed and divorced single-mother families'. *Journal of Marriage and the Family* 62(2): 533–548.
- Björklund, A., Ginther, D.K. and Sundström, M. (2004) 'Family structure and child outcomes in the United States and Sweden'. IZA discussion paper no. 1259. Bonn: IZA.
- Bohrhardt, R. (2000) 'Familienstruktur und Bildungserfolg'. *Zeitschrift für Erziehungswissenschaft* 3(3): 189–207.
- Cherlin, A.J (1978) 'Remarriage as an incomplete institution'. *American Journal of Sociology* 84(3): 634–650.
- Corak, M. (2001) 'Death and divorce: the long-term consequences of parental loss on adolescents'. *Journal of Labor Economics* 19(2): 682–715.
- Daly, M. (2000) *The Gender Division of Welfare. The Impact of the British and German Welfare States*. Cambridge: Cambridge University Press.
- DWP (Department for Work and Pensions) (2004) *Opportunity for All. Sixth Annual Report 2004*, Cm 6239. London: The Stationery Office.
- Dustmann, C. (2004) 'Parental background, secondary school track choice, and wages'. *Oxford Economic Papers* 56(2): 209–230.
- Ermisch, J.F. and Francesconi, M. (2001a) 'Family structure and children's achievements'. *Journal of Population Economics* 14(2): 249–270.
- Ermisch, J.F. and Francesconi, M. (2001b) 'Family matters: impacts of family background on educational attainments'. *Economica* 68(270): 137–156.
- Ermisch, J., Francesconi, M. and Pevalin, D.J. (2001) *Outcomes for Children of Poverty*, DWP research report no. 158. Leeds: Corporate Document Services.
- Ermisch, J., Francesconi, M. and Pevalin, D.J. (2004) 'Parental partnership and joblessness in childhood and their influence on young people's outcomes'. *Journal of the Royal Statistical Society A*, 167(1): 69–101.

- Ginther, D.K. and Pollak, R.A (2004) 'Family structure and children's educational outcomes'. *Demography* 41(4): 671–696.
- Haisken-DeNew, J.P., Buechel, F. and Wagner, G.G. (1997) 'Assimilation and other determinants of school attainment in Germany: do immigrant children perform as well as Germans?'. *Vierteljahreshefte zur Wirtschaftsforschung* 66(1): 169–179.
- Haveman, R. and Wolfe, B. (1995) 'The determinants of children's attainments: a review of methods and findings'. *Journal of Economic Literature* 33(4): 1829–1878.
- Hill, M.S., Yeung, W.-J.J. and Duncan, G.J. (2001) 'Childhood family structure and young adult behaviors'. *Journal of Population Economics* 14(2): 271–299.
- Iacovou, M. (2002) 'Regional differences in the transition to adulthood'. *Annals of the American Academy of Political and Social Science* 580(3): 40–70.
- Jenkins, S.P. and Schluter, C. (2002) 'The impact of family income during childhood on later-life attainment: evidence from Germany'. Working paper 2002–20. Colchester: Institute for Social and Economic Research, University of Essex.
- Jenkins, S.P., Schluter, C. and Wagner, G.G. (2001) *Child Poverty in Britain and Germany*, Anglo-German Foundation Report Series. London: Anglo-German Foundation, <http://www.agf.org.uk/pubs/pdfs/1278web.pdf>, accessed 4 July 2005.
- Jeschek, W. (2000) 'General education and vocational training in East Germany and participation in education'. *Quarterly Journal of Economic Research* 69(2): 295–316.
- Jonsson, J.O. and Gähler, M. (1997) 'Family dissolution, family reconstitution, and children's educational careers: the case of Sweden'. *Demography* 34(2): 277–293.
- Lang, K. and Zagorsky, J.L. (2001) 'Does growing up with a parent absent really Hurt?'. *Journal of Human Resources* 36(2): 253–273.
- Mahler, P. and Winkelmann, R. (2004) 'Single motherhood and (un)equal educational opportunities: evidence for Germany'. IZA discussion paper no. 1391, November. Bonn: IZA.
- Manski, C. (1995) 'Nonparametric bounds on treatment effects'. *American Economic Review, Papers and Proceedings* 80: 25–37.
- Martiny, D. and Schwab, D. (2002) 'Grounds for divorce and maintenance between former spouses: Germany', <http://www2.law.uu.nl/priv/cefl/Reports/pdf/Germany02.pdf>, accessed 4 July 2005.
- McLanahan, S. and Sandefur, G. (1994) *Growing Up with a Single Parent: What Hurts, What Helps*. Cambridge, MA: Harvard University Press.
- Riphahn, R.T. (forthcoming) 'Are there diverging trends in the educational attainment of nationals and second generation immigrants?'. *Journal of Economics and Statistics (Jahrbuch für Nationalökonomie und Statistik)*. (Earlier version [2004]: CEPR discussion paper no. 2903.)

Ruhm, C.J. (2004) 'Parental employment and child cognitive development'. *Journal of Human Resources* 39(1): 155–192.

Schröder, G. (2002) 'Gerechtigkeit im Zeitalter der Globalisierung schaffen – für eine Partnerschaft in Verantwortung', Regierungserklärung von Bundeskanzler Gerhard Schröder vor dem Deutschen Bundestag am 29. Oktober 2002 in Berlin, [http://www.bundesregierung.de/emagazine\\_entw,-446416/Regierungserklaerung-von-Bunde.htm](http://www.bundesregierung.de/emagazine_entw,-446416/Regierungserklaerung-von-Bunde.htm), accessed 4 July 2005.

Sieben, I., Huinink, J. and de Graaf, P.M. (2001) 'Family background and sibling resemblance in educational attainment'. *European Sociological Review* 17(4): 401–430.

Siedler, T. (2004) 'Is social assistance dependency transmitted from parents to children? Evidence from German panel data'. Unpublished paper. Colchester: Institute for Social and Economic Research, University of Essex.

Todd, P.E. and Wolpin, K.I. (2003) 'On the specification and estimation of the production function for cognitive achievement'. *Economic Journal* 113(485): F3–F33.

Wagner, G.G., Burkhauser, R.V. and Behringer, F. (1993) 'The English language public-use file of the German Socioeconomic Panel Survey'. *Journal of Human Resources* 28(2): 429–433.

Wojtkiewicz, R.A. (1993) 'Simplicity and complexity in the effects of parental structure on high school graduation'. *Demography* 30(4): 701–717.

ZUMA (Zentrum fuer Umfragen, Methoden und Analysen) (2004) The Digital Information System Social Indicators (DISI), Version 2.1. Computer files downloadable from [http://www.gesis.org/en/social\\_monitoring/social\\_indicators/Data/Disi/disi.htm](http://www.gesis.org/en/social_monitoring/social_indicators/Data/Disi/disi.htm), accessed 4 July 2005.