Adolescent adjustment and well-being: Effects of parental divorce and distress

INGUNN STÖRKSKen, ESPEN RÖYSAMB, TURID L. HOLMEn and KRISTIAN TAMBS

1 Norwegian Institute of Public Health, Norway
2 University of Oslo, Norway
3 HUNT Research Center, Norway


This study investigates the long-term effects of parental divorce on adolescent psychological adjustment and well-being, and to what extent the effects are accounted for by parental psychological distress. Data were collected among 8,984 Norwegian adolescents (13–19 years) and their parents. Outcome variables were symptoms of anxiety and depression, subjective well-being, and three areas of school problems. Parental divorce was found to be associated with both higher mean levels and larger variances in adolescent problems. Divorce and parental distress contributed independently to adolescent distress, supporting the notion of “double exposure” effects. The prevalence of adolescents with substantial distress symptoms was 14% among those with non-distressed non-divorced parents and 30% among those with divorced and distressed parents. In general effects remained when controlling for demographic factors. Long-term effects of divorce on symptoms of anxiety and depression were stronger among girls than among boys.

Key words: Adolescence, divorce, psychological distress, well-being, school problems.

Ingunn Størksen, Centre of Behavioural Research, University of Stavanger, 4036 Stavanger, Norway. E-mail: ingunn.storksen@uis.no

INTRODUCTION

We know from statistics and from our daily lives that divorce is quite common, and that divorce often involves children. In the United States rising divorce rates were seen during the 1960s and 1970s, and in 1992 it was assumed that about half of all marriages would end in a separation or a divorce if the current rates continued (Cherlin, 1992). Recent statistics from Norway imply that also here almost every second marriage (47.8%) will end in divorce (Statistics Norway, 2002). A large number of epidemiological studies conclude with small but significant differences in adjustment and well-being between children of divorced parents and children with no experience of divorce (see Amato & Keith, 1991a and Amato, 2001). Despite small mean effects, parental divorce and child adjustment is still a public health issue due to the very high prevalence of divorce leading to a substantial number of children with various adjustment problems.

Traditionally, relatively more externalizing problems among boys than among girls following a divorce have been expected (Gamezy & Masten, 1994), although this association has been questioned. One study (Hetherington, 1993) demonstrated that by two years after divorce there were no differences in social and emotional development between girls (6 years of age) from divorced and non-divorced families. Although the behavior of boys in divorced families tended to improve during the first two years following the divorce, they still exhibited more problems at home and in school than did boys from non-divorced families. By age 15, however, the sex-difference was diminishing. At this point both boys and girls in divorced families were exhibiting more externalizing and internalizing problems and problems in social competence and in school compared to those in non-divorced families. Rodgers (1994) found elevated levels of depression among women of divorced parents, but not among men of divorced parents. Thus, it can seem as if gender changes its impact as an interacting factor between parental divorce and adjustment problems over the life course.

There have been a number of studies of divorce with a focus on time lapse and age. The results are somewhat diverse. When comparing American 15-year-olds Frost and Pakiz (1990) found that those who had experienced parental separation more recently were more likely to be adversely affected. Generally they scored higher as a group on various measures of antisocial behavior. Another study (Kurtz, 1994) did not find any association between time lapse since marital disruption and coping resources among elementary school-age children. When studying adult psychological distress in a British National birth cohort, Rodgers, Power and Hope (1997) found differences between the groups (divorced/not divorced), but no effect of age at parental separation. Steinberg and Morris (2001) discuss the fact that problems occurring during adolescence can have their roots in earlier ages. Perhaps problems can sometimes be “hidden” in childhood and then be manifested in adolescence, as was the case for the girls in the study of Hetherington (1993) described earlier. Present age with concomitant developmental
challenges might therefore interact with the experience of divorce by activating delayed reactions in the child.

Divorce and marital conflict are associated with poor mental health and depression in the couple involved (Fincham & Beach, 1999; Wade & Cairney, 2000). We also know that offspring of distressed individuals are at increased risk of anxiety and depression (Warner, Mufson & Weissman, 1995), probably due to both environmental and genetic transmission of symptoms in the family. Thus, there is reason to believe that some of the negative effects of divorce on the child's mental health might be mediated through or confounded by parental psychological distress. Many studies of social and psychological adjustment problems among children of divorced parents have concluded that discord and conflict in the family before, during and after a divorce form the most important cause of these problems (Amato & Keith, 1991a; Borrine, Handal, Brown & Searight, 1991). Still, it is not likely that parental conflict is responsible for all of the association between parental divorce and child welfare (Hanson, 1999). Therefore, in this study we undertake to investigate whether parental mental health also might be seen as a mediating factor between divorce and child mental health and adjustment, or whether divorce and parental mental health should be seen as two unique risk factors. Summers, Forehand, ARMISTED and TANNENBAUM (1998) did not find evidence for maternal depression as a mediator between parental divorce in adolescence and young adult adjustment. The reason for this could be that the study relied on a small convenience sample, as suggested by the authors themselves. In an adoption study of 12-year-old children O'Conner, Plomin, Caspi and DeFries (2000) aimed to examine if associations between parental divorce and children's adjustment problems are genetically mediated. Their results suggested that the association between parental divorce and child psychopathology must be environmentally mediated. However, the family environment could be quite strongly affected by parental psychopathology.

Amato and Keith (1991a) and Amato (2001) have raised the question whether larger effects in small samples could be due to publication bias, and that the results in some studies are not fully representative. They also asked whether convenience samples overestimated effect sizes by relying on volunteers. These individuals might be willing to participate in a search for answers and information after troubling outcomes of divorce. Moreover, there has been a request for studies controlling for parental psychological adjustment and studies that use a variety of outcomes. Finally the value of independent reports from parents and children on their adjustment and well-being has been emphasized (Amato, 1993). The present study draws evidence from an epidemiological sample with almost 9,000 adolescent participants. As part of a larger health study, parents and children have reported their feelings of adjustment and well-being separately. Thus, the problems addressed by Amato & Keith are not likely to affect our results.

An overview of the reference lists in different meta-studies and review studies (Amato & Keith, 1991; Amato, 2001; Kelly, 2000) demonstrates an absence of Scandinavian studies of adolescent adjustment and parental divorce. As far as we have been able to detect only one research group in Scandinavia has focused on this specific topic, namely Aro, Palosaari and colleagues (Palossaari, Aro & Laippala, 1996; Aro & Palosaari, 1992). Scandinavian culture differs from cultures in the rest of Europe and the United States in many ways, but perhaps especially regarding social welfare systems, religion and family values. For this reason we believe child and adolescent adjustment to parental divorce deserves research attention in the Scandinavian countries.

We wish to focus on several domains of possible negative outcomes of divorce, both of internalizing and externalizing character. We have included a scale tapping symptoms of anxiety and depression, which serves as an indicator of general internalizing symptoms or psychological distress. Also included is a set of questions on different kinds of school problems, which essentially measure externalizing behavior. Finally we have included a scale for subjective well-being as an indicator of life satisfaction.

**Aims**

The purposes of the present study are fourfold: (a) We want to estimate effects of an experience of parental divorce or separation (occurring in childhood or more recently) on adolescent psychological adjustment and well-being in a general population; (b) We will investigate a possible gender by divorce interaction effect on adolescent psychological adjustment and well-being; (c) We will examine whether effects in any way are altered by time. Does the effect vary with time since divorce, age at divorce or present age? (d) We will investigate whether parental psychological distress operates as a mediator between divorce and symptoms of anxiety and depression in adolescents, or whether parental distress and divorce operate in an independent fashion with unique effects. Furthermore, we investigate whether parental or sibling distress might interact with the experience of divorce.

**METHOD**

The present paper is based on data from a Norwegian normal population study. The Nord-Trondelag Health study (HUNT). Nord-Trondelag is a county of Norway, which contains 3% of the Norwegian population. In most respects the county is fairly representative of Norway, for example regarding geography, economy, industry, sources of income, age distribution, morbidity and mortality (see Holmen et al., 2003). Approximately two-thirds of the almost solely Caucasian inhabitants live in small towns, the remaining population in rural areas. The two studies HUNT II and Young-HUNT were carried out in 1995–97. All inhabitants of Nord-Trondelag county 13 years and older were invited. HUNT II was a follow-up study of HUNT I, which took place in 1984–86.
Participants in HUNT II

Everyone living in Norway has a unique national identification number and population registers based on these numbers are found in all counties. The registers are updated several times a year. Based on these registers lists all residents aged 20 years and above in Nord-Trøndelag received a mailed, personal invitation to take part in the HUNT II study. The invitation contained an appointed date and time for health examination and participation in the questionnaire survey. A total of 94,194 persons were invited to participate in HUNT II. Of the 92,936 eligible individuals for participation, 66,140 persons (71.2%) took part in the study. Among these, 46.7% were men. Further description of HUNT II can be read elsewhere (Holmen et al., 2003). We used data from HUNT II to estimate psychological distress among the parents of the target subjects (the adolescents) in this study.

Participants in Young-HUNT

The ascertainment of the data for Young-HUNT was mainly organized through the local school system. All students in junior high school and senior high school aged 13 through 19 were invited. Adolescents not currently in the school system were identified through lists obtained from “the follow-up service” of the county education authorities. A total of 8,984 adolescents (88.1% of all invited) participated. Among these 50.3% were boys. Mean age was 16 years. The adolescents participating completed a questionnaire during one school hour. Physical examination and structured interviews were also conducted. Each adolescent signed a written consent to participate in the study. Adolescents younger than 16 years of age also brought signed statements of consent from one of their parents. The participants were instructed to fill in the questionnaires separately. The questionnaire was only identifiable by a bar code of the national identification numbers described above. Statistics Norway re-coded these identification numbers to encrypted ID codes to secure anonymity. These ID codes made it possible to link data from parents in HUNT II with data from their adolescent children in the Young-HUNT data material. Further description of the Young-HUNT data material can be read elsewhere (Holmen, 2000).

Of the 8,984 adolescents included in the study 1,810 (20.2%) answered “yes” to the question “Have your parents ever separated or divorced or have any of them moved away for more than a year?” These adolescents were included in the Divorce group. This group also includes parents that have split up from cohabitation. The questionnaire further included a question about age at parental separation or divorce. Mean age at parental divorce or separation was 7.7 years (SD = 4.7). The Divorce group was compared to those who did not report parental separation or divorce, \[ n = 6,784 \] (75.5%), which was labeled the No Divorce group. Among these a small number who were born out of wedlock had lost a parent through death will have lived most parts of their lives with only one parent. Some of the oldest adolescents would already have moved out of their parents’ house, thus the term “No Divorce”. A small number (4.3%) of the adolescents did not answer the questions regarding divorce, and were not included in the analyses.

Questions and scales

Among the adults in HUNT II symptoms of anxiety and depression (also referred to as distress symptoms in this paper) were measured by ten of the 25 items from Symptom Checklist-25 (SCL-25) (Winokur, Winokur, Rickels & Cox, 1984). For both SCL-10 and SCL-5 (Young-HUNT, described later) answers are scored according to a scale ranging from “not at all” (1) to “extremely” (4). One example of a statement is “Worry too much about things”. A comparison of this ten-item version and the original version in other available data material (a sub-sample of HUNT I, described by Tambs & Moum, 1993) showed that the correlation between the scores from the original and the ten-item versions was 0.97. In the present study the observed Cronbach alpha reliability was 0.87 for mothers and 0.86 for fathers. A cut-off point of 1.85 is established for this ten-item version. A score above this point indicates that the individual is troubled with symptoms of anxiety and depression in his/her daily life (Strand, Dalgård, Tambs & Rognerud, 2003).

Several questionnaires were completed in HUNT II. One was unfortunately implemented some time after the study was initiated, thus only 55% of the individuals eligible for participation completed this questionnaire. Therefore we have SCL-10 data either for mother, father or both for only 6,478 of the 8,984 adolescents. However, there were eight questions about symptoms of anxiety and depression included in the original HUNT II questionnaire. In an analysis for mothers and fathers separately, SCL-10 regressed on these eight questions gave \( R = 0.74 \) and \( R = 0.73 \) respectively (\( r = 0.86 \) and \( r = 0.84 \) when corrected for measurement error by means of latent factor modeling in EQS Structural Equation Program). We therefore used the eight questions to impute parental SCL-10 data for individuals that had not completed the questionnaire with SCL-10 items (SPSS 11.0, MVA procedure, EM option). This increased the cases with parental SCL-10 data (for mother, father or both) to 7,863. In 5,487 cases we have SCL-10 data for both parents, in 617 cases only for father, and in 1,759 cases only for mother. The biological parents’ mean SCL-10 scores were used as a control variable in our analyses. The four-step regression analysis with the main results from this study was run twice, first with the original parental SCL-10 data and then with SCL-10 data with imputations. Results showed virtually identical results in the two analyses with a difference in standardized beta coefficients ranging from 0.0 to 0.006 (with adolescent SCL-5 as outcome).

For the Young-HUNT group symptoms of anxiety and depression (also referred to as distress symptoms in this paper) were measured by SCL-5. This is a five-item scale based on SCL-25, which has proven reliable in earlier studies (Tambs & Moum, 1993). In the present study the SCL-5 reached a Cronbach alpha of 0.79. A comparison study of the SCL-10 and SCL-5 has shown a correlation of 0.91 between the two versions. A cut-off point at 2.0 has been suggested for this five-item version of SCL-25 (Strand et al., 2003), and this cut-off point has been utilized in the present study to determine whether or not the adolescents are troubled with symptoms of anxiety and depression in their daily lives. The distribution of SCL-scores is quite skewed, and the mean score indexes for both adolescents and parents were therefore subjected to a logarithmic transformation in order to counteract skewing when the variables were used in the regression analyses.

The Subjective Well-being (SWB) scale consisted of three questions. They have a linguistic form that is typical for well-being scales (Andrews & Robinson, 1988). The three questions were phrased as follows: “When you think about your life at the moment, would you say that you by and large are satisfied with life, or are you mostly dissatisfied?”; “Do you mostly feel strong and fit, or tired and worn out?”; and “Would you say you are usually cheerful or dejected?”

Answers were categorized into a seven-point scale ranging from (for the first question) “very satisfied” (1) to “very dissatisfied” (7). The questions have been applied in more than 20 previous publications based on HUNT data and other data (e.g. Moum, Ness, Sørensen, Tambs & Holmen, 1990a, 1990b). In the present study the three items reached a Cronbach alpha of 0.75.

The adolescents were asked to consider 14 statements about school functioning. Evaluations of whether the statements held true for each individual were given on a four-point scale ranging from “never” (1) to “very often” (4). The school-functioning statements were composed at the Norwegian Institute of Public Health, and © 2006 The Scandinavian Psychological Associations/Blackwell Publishing Ltd.
were also included in an earlier study of childhood abuse at the same institute (Tambs, 1994). The statements were subjected to a factor analysis with an oblique rotation. Based on eigenvalues and screeplots three meaningful factors were extracted. Mean score indexes were calculated for each factor. The factors were labeled “Academic” (highest loading item: “I have problems concentrating in class”), “Conduct” (highest loading item: “I am reprimanded by my teacher”), and “Dissatisfaction” (highest loading item: “I look forward to going to school”). Cronbach alphas based on standardized items for the three were 0.67, 0.64, and 0.57 respectively.

Control variables

Since we lack information about the specific economic and residential arrangements in each family, the construction of a family socio-economic status (SES) indicator was based on available data for education and income in both biological parents. In our data material, education was split into nine categories according to length of education. The income information derives from the governmental Statistics Norway’s tax and income registry. To generate a family SES indicator, variables for education and income for mothers and fathers were standardized and summarized.

We constructed a dummy variable for steps-parent based on the adolescents’ reports of living either with a stepmother or stepfather (1 = living with a step-parent, 0 = not living with a step-parent). Likewise we also constructed a dummy variable for adolescents who did not report parental divorce, but at the same time reported living with only one biological parent, and we named this variable “single parenthood”. We found a higher occurrence of adolescents living alone (not living at their biological parents’ house at the present time) among the subjects in the Divorce group compared to the No Divorce group. We wished to control such a life situation, since it obviously can represent a general stress factor in an adolescent’s life, and constructed a dummy variable labeled “adolescent living alone”.

Missing

On the scale level participation was very good. For the five outcome variables we have data for between 97.9 and 99.1% of the 8,984 cases participating in this study. Moreover, number of missing items within each scale was also low. Less than 0.4% of the participants with any data had missing data on more than half of the items within each scale. Therefore, the scales were constructed by utilizing mean score indexes of available items.

Statistical analyses and coding

Multiple linear regression analyses were utilized for the further analyses. Outcome variables were standardized before the analyses. For independent variables with natural categories (e.g. divorced/not divorced) we report unstandardized coefficients. For independent variables with no natural categories standardized beta coefficients are reported (Parental SCL-10 and Socio-economic Status). The figures listed in the regression table are therefore comparable with effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988). Possible interaction effects of parental divorce by gender on the different outcome variables were tested by effect sizes (Cohen, 1988).

To test for fit between model and data we used the Chi-square, the Comparative Fit Index (CFI) (see e.g. Browne & Cudeck, 1993; Jöreskog & Sörbom, 1993).

RESULTS

The means and standard deviations for all variables for boys and girls separately are shown in Table 1. The table also shows the variables’ correlation with age. Symptoms of anxiety and depression increase with age, and girls generally report more of these kinds of symptoms than do boys. Reported subjective well-being is lower among the older adolescents than the younger, and boys report higher subjective well-being than girls. Girls report more academic problems than do boys, although the difference is very small. Academic problems increase with age for both sexes. The boys report more conduct problems than do girls, and conduct problems correlate negatively with age for both boys and girls.

A comparison between the No Divorce group and the Divorce group for the five outcome variables is shown in Table 2. There were moderate, but significant mean differences between the groups for all variables with poorer scores in the Divorce group. There were significantly higher variances for all variables in the Divorce group compared to the No Divorce group.

We ran regression analyses to test for possible interaction effects of divorce by gender for all outcome variables. The interaction term was added in a fourth step of the regression analysis – where only the effects of the interaction term are listed – see Table 3. Results showed a significant interaction
effect between divorce and gender on SCL-5, meaning that adolescent girls respond more with enduring symptoms of anxiety and depression to a divorce than do boys. There were no other interaction-effects between divorce and gender for the other outcome variables.

One aim of this study was to test for the effects of time lapse since parental divorce and age at parental divorce on adolescent adjustment and well-being. In five regression analyses – one for each outcome variable – that were adjusted for present age there was no evidence of an association between age at parental divorce and adolescent adjustment and well-being. In a separate set of regression analyses that were also adjusted for present age, there was no evidence of an association between time lapse since parental divorce and adolescent adjustment and well-being. We examined the relationship between present age and effects of divorce. There was no linear interaction effect between present age in adolescence and divorce on the outcome variables. There seemed to be a trend towards a curve-linear age × divorce effect on SCL-5 scores. The results showed a stronger effect of divorce in mid-adolescence compared to early and late adolescence on this variable. The difference between the two groups reached a peak at age 17, with an effect size of 0.33 compared to 0.15 at age 13 and 0.09 (ns) at age 19. A regression analysis with a curve-linear interaction term did not show a significant interaction effect, however (p = 0.07).

Our final aim was to investigate whether parental psychological distress operates as a mediator between divorce and symptoms of anxiety and depression in adolescents, or whether parental distress and divorce operate in an independent fashion with unique effects. We also wished to test if a control for parental psychological distress would reduce the effect of divorce in a more general way, that is, for

Table 2. Means and standard deviations for the No Divorce group and the Divorce group

<table>
<thead>
<tr>
<th></th>
<th>No divorce</th>
<th>Divorce</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>SCL-5</td>
<td>1.43</td>
<td>0.47</td>
</tr>
<tr>
<td>SWB</td>
<td>5.34</td>
<td>0.90</td>
</tr>
<tr>
<td>Academic*</td>
<td>1.89</td>
<td>0.42</td>
</tr>
<tr>
<td>Conduct*</td>
<td>1.45</td>
<td>0.40</td>
</tr>
<tr>
<td>Dissatisfaction*</td>
<td>2.27</td>
<td>0.51</td>
</tr>
</tbody>
</table>

 Asterisks in the column “M Divorce” indicate level of significance of difference between means in the groups no divorce and divorce. Asterisks in the column “SD Divorce” indicate level of significance of difference between standard deviations in the two groups.

Table 3. Regression analysis for variables predicting psychological adjustment problems in adolescents

<table>
<thead>
<tr>
<th></th>
<th>SCL-5</th>
<th>SWB</th>
<th>Academic*</th>
<th>Conduct*</th>
<th>Dissatisfaction*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Parental Divorce</td>
<td>0.24***</td>
<td>−0.28***</td>
<td>0.35***</td>
<td>0.21***</td>
</tr>
<tr>
<td>Step 2</td>
<td>Parental Divorce</td>
<td>0.23***</td>
<td>−0.27***</td>
<td>0.32***</td>
<td>0.19***</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>0.05***</td>
<td>−0.08***</td>
<td>0.13***</td>
<td>−0.04***</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>0.50***</td>
<td>−0.27***</td>
<td>0.06***</td>
<td>−0.24***</td>
</tr>
<tr>
<td></td>
<td>Socio-economic Status</td>
<td>0.03*</td>
<td>0.01</td>
<td>−0.09***</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Single parenthood</td>
<td>0.32***</td>
<td>−0.09</td>
<td>0.12</td>
<td>−0.07</td>
</tr>
<tr>
<td></td>
<td>Stepparent</td>
<td>−0.04</td>
<td>0.04</td>
<td>−0.03</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>Adolescent living alone</td>
<td>0.15***</td>
<td>−0.16***</td>
<td>0.20***</td>
<td>0.05</td>
</tr>
<tr>
<td>Step 3</td>
<td>Parental Divorce</td>
<td>0.18***</td>
<td>−0.23***</td>
<td>0.20***</td>
<td>0.17***</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>0.08***</td>
<td>−0.08***</td>
<td>0.13***</td>
<td>−0.04***</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>0.50***</td>
<td>−0.28***</td>
<td>0.06***</td>
<td>−0.24***</td>
</tr>
<tr>
<td></td>
<td>Socio-economic Status</td>
<td>0.04***</td>
<td>−0.01</td>
<td>−0.08***</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Single parenthood</td>
<td>0.25**</td>
<td>−0.06</td>
<td>0.09</td>
<td>−0.08</td>
</tr>
<tr>
<td></td>
<td>Stepparent</td>
<td>−0.01</td>
<td>0.02</td>
<td>−0.02</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Adolescent living alone</td>
<td>0.17***</td>
<td>−0.16***</td>
<td>0.10***</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Parental SCL-10</td>
<td>0.11***</td>
<td>−0.09***</td>
<td>0.07***</td>
<td>0.03*</td>
</tr>
<tr>
<td>Step 4</td>
<td>Parental divorce × Gender</td>
<td>0.13*</td>
<td>−0.05</td>
<td>0.03</td>
<td>−0.06</td>
</tr>
</tbody>
</table>

Notes: Before analyses outcome variables were standardized. Reported figures are unstandardized regression coefficients. SCL-10 and SCL-5 = symptoms of anxiety and depression. SWB = Subjective well-being. * = School related problems.
 For the variable Gender 1 = Boys and 2 = Girls.
 For the dummy variables Single parenthood, Stepparent, and Adolescent living alone, the value 1 = yes and 0 = no.
 * p < 0.05; ** p < 0.01; *** p < 0.001.
subjective well-being and school problems. Table 3 shows the
results from a four-step regression analysis. In the first step
parental divorce was the only predictor. In step two we
included possible confounding variables (Age, Gender, SES,
Single parenthood, Stepparent, and Adolescents living
alone). In step three we included parental SCL-10. Finally,
in step 4, the effects of an interaction term of parental
divorce by gender are listed. There was a moderate but
significant effect of parental divorce on all outcome vari-
bles before the introduction of control variables. The largest
effect of divorce on adolescent adjustment was seen in
academic problems, with a difference of 0.35 of a standard
deviation between the two groups. The introduction of the
demographic variables and the family structure variables
slightly reduced the effect of divorce for SCL-5, Subjective
well-being, Academic and Conduct. Given that most of the
adolescents of divorce live with their mothers, we ran separate
analyses where the mean score of the mothers’ income
and education was utilized as the only indicator of the
family’s SES. The effect of SES in these analyses varied with
only +/- 0.02 compared to the effect of SES in the original
analyses. Therefore we report only the family SES indicator
that is based on both mothers’ and fathers’ income and
education. There was a moderate but significant effect of
parental SCL-10 scores on all outcome variables, and
the application of this variable resulted in a small reduction
of the effects of divorce on all outcome variables.

Finally, we tested a model in which parental divorce was
hypothesized to have both a direct effect and an effect medi-
atated by parental symptoms of anxiety and depression in
EQS, depicted in Fig. 1. A model with two groups – one for
boys and one for girls – was applied, since we assumed that
the effect of parental divorce and age on adolescent distress
symptoms varied between genders. Adolescent symptoms of
anxiety and depression were utilized as outcome variable,
and this variable was dependent on all other variables.
Maternal and paternal symptoms of anxiety and depression
were dependent on divorce and were also allowed to cor-
relate with each other in the model. Divorce and age were
observed variables, and maternal, paternal and adolescent
symptoms of anxiety and depression were latent variables.
The five-factor loadings of the latent variable for adolescent
symptoms of anxiety and depression were constrained to be
equal for boys and girls. As a first step we ran a model in
which the effects of maternal and paternal distress symp-
toms, divorce and age were constrained to have an equal
effect on the latent variable for symptoms of anxiety and
depression among boys and girls. Also the effects of divorce
on paternal and maternal distress were constrained to be
equal in the two groups. The model gave good fit with a CFI
of 0.90 and a RMSEA of 0.04, \( \chi^2 = 5,147.4, df = 648 \). A
Lagrange Multiplier test was applied in order to test cross-
group equality of the various paths. The modification
indexes revealed that a release of two constraints would give

![Fig 1](image-url). Two-group (boys and girls) path model of the direct effect of parental divorce on adolescent anxiety and depression and as mediated
through paternal and maternal anxiety and depression, controlling for adolescent age.

Notes: Standardized path coefficients for boys and girls are noted sequentially, with the coefficients for girls noted in bold. Paths that are
significantly different for boys and girls are marked with an asterisk.
a significant chi-square change, implying that these effects varied in size between the genders. The two constraints concerned the paths deriving from parental divorce and age onto adolescent psychological distress. When the two constraints were released the model gave a better fit with a CFI of 0.90 and a RMSEA of 0.04, $\chi^2 = 5,131.3$, $df = 646$ ($\Delta \chi^2 = 16.1$, $\Delta df = 2$, $p < 0.001$). The effects for boys and girls are listed sequentially in Fig. 1. Since we report standardized effects, it can seem as if some of the effects with no evidence of divergence actually vary between the genders. The effects where the results actually imply divergences between boys and girls are marked with asterisks.

As shown in Fig. 1, maternal and paternal distress symptoms, and divorce affect adolescent symptoms of anxiety and depression to an almost equal degree. Furthermore, even if there is an association between divorce and parental symptoms, and between parental symptoms and adolescent symptoms, the effect mediated through parental mental health is negligible.

In order to follow up the model, we calculated the effect of “double-exposure” or, in other words, the effect of being exposed to both divorce and parental anxiety and depression scored above the cut-off for SCL-5. Divorce alone gave a 20.1% prevalence, while exposure to anxiety and depression in one or both parents (Parental distress) gave a 19.1% prevalence. In the group of adolescents with parental divorce and where one or both parents scored above the SCL-10 cut-off, 30.4% scored above the cut-off for SCL-5. We constructed an interaction term by multiplying Parental distress with Divorce, which was included in a logistic regression analysis with adolescent distress as outcome. We adjusted for possible confounding variables, as listed in step 2 of the regression analysis in Table 3. The interaction term was not significantly related to adolescent distress (OR = 1.21; 95% CI 0.78–1.88).

DISCUSSION

Effects of parental divorce on adolescent psychological adjustment and well-being

Generally there were moderate but significant differences between the group of adolescents that had experienced parental divorce and the group of adolescents that had not. Even 8 years after divorce (on average), the adolescents report more symptoms of anxiety and depression, a lower feeling of well-being, and more school-related problems than their counterparts whose parents stayed together. The dimension of the effects are in accordance with other studies in this area, perhaps even slightly larger than in the before-mentioned meta-analysis regarding psychological adjustment (SCL-5 and SWB) and school achievement (academic problems) (Amato & Keith, 1991a). A main reason for these somewhat larger effect sizes can be that this study relies on self-reports. As mentioned in the introduction, divorce is quite common in Norway. Therefore social stigmatization does not seem likely as an explanation of poorer mental health and well-being in the Divorce group. Other studies have suggested that high prevalence of psychological morbidity among children of lone-mothers is partly a consequence of socio-economic differences (McMunn, Nazroo, Marmot, Boreham & Goodman, 2001). In Norway divorced parents with custody receive economic compensation, and children of single parents have priority in public day-care arrangements. When, despite this, there is more psychological distress and reduced well-being in adolescents of divorce, the reason could be enduring conflict and problems in the family, e.g., because of disagreement about custody. There is also a possibility that adolescents to a larger extent than younger children are made to feel responsible for choice of where to live, and that this could represent a source of loyalty conflict with a concomitant reduction of psychological adjustment and well-being.

The strongest effect of divorce in this study is seen to be on academic problems. Such problems in children after a divorce are often explained by lack of parental support and of focus on school and homework. Obviously, when one parent is absent and the other parent has even more chores and duties than before, as is often the case, this can reduce academic attention and support to the child. Problems can accumulate over time. A possible reason that academic problems in connection with divorce are more pronounced in this study compared to other studies might be that the target group is adolescents. Table 1 shows how academic problems increase with age and conduct problems decrease with age. Furthermore conduct problems do not form the most pronounced symptom associated with divorce; this finding is contrary to other studies focusing mainly on children (Amato & Keith, 1991a). Maybe acting out (conduct problems) is a more typical reaction to negative life events for children and younger adolescents, whereas academic problems are more typical later, as academic demands increase. Other studies have also demonstrated a reduced educational attainment among adult children of divorced parents (Amato & Keith, 1991b).

Gender differences in effects of parental divorce

The girls to a larger extent report enduring symptoms of anxiety and depression in association with parental divorce than do boys. Or perhaps such a gender difference was not present at earlier developmental stages, but came to appearance during adolescence? Previous research and theory has also indicated more depressed mood among adolescent girls than adolescent boys in association with different strains and life events (Wichstrom, 1999; Cyranowski, Frank, Young & Shear, 2000; Petersen, Sarigianni & Kennedy, 1991). Rodgers (1994) found elevated levels of depression among women with divorced parents, but not among men.
The effect of time

In accordance with several other studies (Kurtz, 1994; Bynum & Durm, 1996; Rodgers et al., 1997), we did not find strong evidence implying that age at parental divorce or time elapse since divorce altered the effect of parental divorce. It is important to note that we cannot rule out possible effects of age at parental divorce or time elapse since divorce completely, due to the strong association between the two. If, for example, young age at parental divorce was related to adjustment problems, and time lapse since divorce was negatively related to adjustment problems, one effect could very well overshadow the other and give no overall effect of time. The problem of separating out the two effects also applies to many other studies.

Even if the effects of parental divorce are moderate, it is interesting that they seem to be stable over time. The results are contradictory to an assumption that parental divorce is a distressing life event on the same level as other periodical strain-reactions that decrease with time, although acute immediate reactions probably differ from long-term reactions (Frost & Pakiz, 1990). In which way specific effects of parental divorce operate over time is only partially known. We did not find a specific age at which adolescents are especially vulnerable for long-term effects after parental divorce. Individuals in mid-adolescent years seemed to be more vulnerable to a reaction with symptoms of anxiety and depression in our study, but such a trend did not reach statistical significance. However, a possible interpretation of this trend could be adolescent exploration of intimacy and commitment in romantic relationships, which could activate psychological distress associated with the parental divorce.

Effect of divorce after controlling for parental symptoms of anxiety and depression

Finally we turn to the question: Are adolescent adjustment problems in association with divorce mediated through or confounded by parental symptoms of anxiety and depression? In cross-sectional data such as these, it would be impossible to discriminate between a possible mediation and a confounding effect. However, this question is no longer of interest here. The results clearly demonstrate that even if a control for parental mean SCL-10 scores somewhat reduces the effect of divorce on adolescent psychological adjustment and well-being, this effect remains significant and is only slightly reduced. A hypothesis that adjustment problems among adolescents of divorce are not mediated through or confounded by parental psychological distress is strengthened (Summers et al., 1998). Although there is a certain amount of overlapping variance between parental divorce and psychological distress, adolescent adjustment problems are mainly explained through unique variance in the two factors. This implies that adolescents affected by both risk factors are at “double-risk” of adjustment problems. The finding that adolescent adjustment problems are mainly explained through unique variance in the two risk factors is in accordance with a study of Nomura, Wickramaratne, Warner, Mufson & Weissman (2002).

The demographic variables and family variables also accounted for some of the difference between adolescents of divorce and no divorce. We note that after adjusting for all variables the effects of divorce are quite moderate. Results further show significantly larger variance for all measures of psychological adjustment and well-being among the adolescents in the Divorce group compared to those in the No Divorce group. This could be an indicator of individual differences, where some have small or no reactions to the divorce, while others have more severe reactions and symptoms following parental divorce. Some individuals might even benefit from parental divorce in various ways, for example through relief from parental conflict.

Limitations and strengths

Because of a small number of recent parental divorces (less than 1% the last year before the study), we have not been able to compare acute immediate reactions in association with parental divorce with long-term reactions. Also, since we did not have data for economic arrangements in each family, we had to rely on a mean score of mothers’ and fathers’ education and income as a family SES indicator. However, the effect of this indicator very much resembled the effect of an indicator that was solely based on the mothers’ education and income. Cross-sectional data will always have limitations concerning cause and effect. In the present study a causal effect from parental psychological distress via divorce to child symptoms could also seem likely. However, this would not change the fact that the adolescent child is affected mainly through unique variance in divorce and parental distress, and only to a small degree through variance shared by the two risk factors. A more important concern is our limitation in controlling for family conflict. As mentioned in the introduction, research has proven family conflict to be of crucial importance to child adjustment problems after divorce. This study does not permit a separation between direct effects of divorce and effects of parental conflict prior to and after the divorce. Finally, we would like to mention that the very high participation (88.1%) is no guarantee for this study to be free from recruitment bias. Weitoft, Hjern, Haglund, and Rosén (2003) demonstrated that growing up with a single parent puts the child at risk for severe outcomes such as psychiatric disease, death, and alcohol- and drug-related disorders. Obviously factors such as these could be likely reasons for not participating in health studies such as Young-HUNT. Our results may therefore represent an underestimation of the true outcomes of divorce. Some amount of uncertainty also exists regarding the control for parental distress, which relies on mean scores from the biological parents that participated in the study.
the other hand, we believe that the large number of subjects (close to 9,000 adolescents) and the high level of participation are clear strengths in this study. Data are collected through self-report (parent and child individually) and from official statistics. Using public registry numbers to link family members gave us the possibility to control paternal levels of anxiety and depression, whereas other studies (Demo & Acock, 1996; Summers et al., 1998) have had to rely solely on data from the mothers.

CONCLUSION

The adolescents of divorce were more deeply affected than their counterparts in all areas of adjustment problems included in this study. There was a larger variance among the adolescents in the Divorce group compared to those in the No Divorce group, which suggests that some adolescents, but not all, are affected negatively by divorce. Girls to a larger extent than boys reported enduring symptoms of anxiety and depression in association with divorce. After accounting for parental psychological distress, demographic factors, and family structure, there were still moderate but significant differences between the two groups on all variables. Although the results showed only a minimal causal mediation, anxiety and depression in mother or father, and parental divorce seemed to be three important risk factors for adolescent anxiety and depression. Among the adolescents exposed to both divorce and parental distress there was a high prevalence of distress symptoms.

The Nord-Trøndelag Health Study (HUNT) is a collaboration between HUNT Research Center, Faculty of Medicine, Norwegian University of Science and Technology (NTNU, Verdal), Norwegian Institute of Public Health, and Nord-Trøndelag County Council. The Research Council of Norway supported this study through grant number 139352/300.


Received 8 June 2004, accepted 1 March 2005

© 2006 The Scandinavian Psychological Associations/Blackwell Publishing Ltd.