EFFECTS OF PARENTAL DIVORCE ON MENTAL HEALTH THROUGHOUT THE LIFE COURSE*

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The long-term effects of parental divorce on individuals' mental health after the transition to adulthood are examined using data from a British birth cohort that has been followed from birth to age 33. Growth-curve models and fixed-effects models are estimated. The results suggest that part of the negative effect of parental divorce on adults is a result of factors that were present before the parents' marriages dissolved. The results also suggest, however, a negative effect of divorce and its aftermath on adult mental health. Moreover, a parental divorce during childhood or adolescence continues to have a negative effect when a person is in his or her twenties and early thirties.

Although a substantial literature exists on the effects of divorce on children and young adults, little is known about the continuing effects, if any, of a parental divorce over the adult life course. Most studies of adults are based on cross-sectional surveys in which individuals retrospectively report their family structures, and most studies address only young adulthood (Glenn and Kramer 1985; McLanahan 1985; Bumpass, Martin, and Sweet 1991). Consequently, only limited inferences can be drawn about patterns of effects into midlife.

Prospective studies of children—longitudinal studies that begin before the children's parents divorce—suggest that some of the differences between children who later experience parental divorce and those who do not were observable before the divorces occurred (Block, Block, and Gjerde 1986; Cherlin et al. 1991). We call these differences "predisruption effects"—they cannot be a result of the disruption because the disruption has not yet happened. Rather, these differences may be caused by parental conflict prior to the divorce or they may indicate characteristics of the children or their parents that influenced the parents' marriages and the children's lives. These predisruption differences could still be observed in adulthood. For example, a shared genetic tendency in a family, such as a history of depression, could contribute both to parents' marital distress and divorce, and to children's depression in young adulthood, thus giving the misleading impression that the parental divorce caused the depression.

The time between a parental divorce and the end of the transition to adulthood has been the most widely studied period (Amato and Keith 1991). Many articles and books demonstrate associations between parental divorce and aspects of the transition to adulthood, such as low educational attainment and early childbearing (McLanahan and Sandefur 1994), and more premarital cohabitation (Cherlin, Kiernan, and Chase-Lansdale 1995; Thornton 1991). Chase-Lansdale, Cherlin, and Kiernan (1995) found that experiencing a parental divorce before age 16 was associated with poorer mental health in a large sample of 23-year-olds, even when controlling for measured predisruption differences.

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Few studies, however, consider whether the effects of parental divorce, if any, diminish or stabilize *after* the transition to adulthood or whether the effects increase as adults from divorced families enter their thirties. A life-course perspective suggests that the disruption could trigger intervening events that negatively affect adult mental health. Studies in clinical and developmental psychology also suggest that negative trajectories of poor mental health may be lasting for some individuals. Research shows substantial continuity between childhood depression and adult depression (Harrington et al. 1990), with evidence that persons whose first onset of depression occurs before age 20 have a higher likelihood of recurrence than do those whose first episode occurs after age 20 (Giles et al. 1989). And some studies report that parental divorce in childhood is associated with depression in adulthood (Lauer and Lauer 1991). Thus, parental divorce may cause an initial depressive episode in children and adolescents, and depression may recur in adulthood.

We analyze information on mental health—behavior problems and malaise—from a large study of British individuals who have been followed since their births in 1958 and who were last interviewed at age 33 in 1991. By age 33, virtually all of the sample had completed their full-time education, 83 percent had married at least once, and 67 percent had had a child (Ferri 1993). The data set is central to the recent literature (Cherlin et al. 1991; Chase-Lansdale et al. 1995; Cherlin et al. 1995), although this is the first U.S. article to include the age-33 wave.

We trace the effects of parental divorce on indicators of mental health over the entire sweep of the British study—from age 7 when behavioral information was first collected, through assessments at ages 11, 16, 23, and 33. We present estimates from growth-curve models (which belong to a larger class of models called random-effects models) and fixed-effects models. Random-effects and fixed-effects models can be applied to panel data—longitudinal data in which a cross-section of individuals is repeatedly interviewed.

Growth-curve models are presented in texts on hierarchical models. These models are well-known to sociologists (Bryk and Raudenbush 1992), but they have been used primarily by psychologists (Ragosa, Brandt, and Zimowski 1982; Burchinal and Appelbaum 1991; Willett, Ayoub, and Robinson 1991; Barnett et al. 1993, 1995). To our knowledge, only one article using growth-curve models has been published in a mainstream sociology journal (McLeod and Shanahan 1996; but see unpublished papers by Kerbow [1992] and Hoffer [1994]).[1]

DATA AND VARIABLES

The National Child Development Study (NCDS) is a longitudinal study of children who were born in England, Scotland, and Wales in the first week of March 1958. Divorce rates in Britain are the highest in Western Europe (and therefore are similar to the U.S. rates, which are even higher). In 1965, 11 percent of recent marriages in Britain were predicted to end in divorce, a figure that rose to 32 percent in 1975 and 44 percent in 1991 (Monnier 1990; Guibert-Lantoine and Monnier 1995). In general, trends in marriage, divorce, and fertility in Britain parallel those in the United States, possibly because of the common English-speaking culture (Kiernan 1988).

The NCDS has been described and analyzed elsewhere (Chase-Lansdale et al. 1995; Cherlin et al. 1995), so we do not discuss it in full detail here. Interviews were conducted with 17,414 mothers, who accounted for 98 percent of all births in that week (Shepherd 1985). Follow-up interviews were conducted with parents and teachers when the children were 7, 11, and 16. At ages 23 and 33, the cohort members themselves were interviewed. We focus on the 11,759 cohort members whose parents were in intact marriages at age 7, when information about the child other than birth weight was first collected, and for whom there is subsequent information on their parents' marital status.[2] This re-

[1] A methodological presentation of the use of growth-curve models in studies of marital quality is presented in Karney and Bradbury (1995).

[2] In a previous article, we used the NCDS data through the age-23 wave. We attempted to adjust for the possible sample-selection bias inherent in retaining only the subset of children whose parents were still married at age 7 and who were later interviewed at age 23. The standard two-stage correction procedure (Heckman 1979;

striction allowed the construction, using confirmatory factor analysis, of three latent-variable measures representing predisruption characteristics at age 7 (Chase-Lansdale et al. 1995): (1) *class background*—a combination of father's occupation (manual versus nonmanual), whether the father stayed in school past minimum age, and whether the mother stayed in school past minimum age; (2) *economic status*—a combination of whether the family owned (versus rented) its home, the number of persons per room in the household, and an indicator of whether the family was experiencing "economic difficulties"; and (3) *school achievement*—a combination of scores on a standardized reading achievement test, on a standardized mathematics test, and on a five-item scale of teacher's assessments of "oral ability," "awareness of the world around him," "reading," "creativity," and "number work" (alpha reliability is .89).

In addition, at the age 7 interview, parents were asked to rate their child's behavior problems using most of the items from the Rutter Home Behaviour Scale (Rutter, Tizard, and Whitmore 1970). The scale was designed to identify two broad groups of behavior problems in children: *externalizing disorders*, in which the child exhibits undercontrolled behavior such as aggression or disobedience; and *internalizing disorders*, in which the child exhibits overcontrolled behavior such as anxiety or depression. An 18-item summed scale had an alpha reliability of .71.[3] This behavior-problems scale at age 7 is our initial, predisruption measure of emotional problems. At ages 11 and 16, parents were again asked to rate behavior problems using similar items: A 10-item scale at age 11 had an alpha reliability of .68 and a 22-item scale at age 16 had an alpha reliability of .75.

Maddala 1983) did not alter the results (Cherlin et al. 1995). We do not include a sample-selection correction in the analyses reported here.

[3] The items forming the emotional-problems scales at ages 7, 16, 23, and 33 are presented in Chase-Lansdale et al. (1995). The items at age 11 were: difficulty settling in, bullied by other children, destroys others' property, miserable or tearful, squirmy or fidgety, worries, irritable (quick to fly off the handle), upset by new situations, fights with other children, and disobedient.

Table 1. Means and Standard Deviations of Variables Used in the Analysis

Variable	Mean	Standard Deviation
Emotional problems at age 7	0	1.0
Emotional problems at age 11	0	1.0
Emotional problems at age 16	0	1.0
Emotional problems at age 23	0	1.0
Emotional problems at age 33	0	1.0
Age minus 7	10.4	9.2
Parental divorce between ages 7 and 22	.09	.29
Parental divorce between ages 7 and 10	.02	.15
Parental divorce between ages 11 and 15	.04	.19
Parental divorce between ages 16 and 22	.03	.17
Parental divorce between ages 23 and 33	.02	.14
Gender (1 = female, 0 = male)	.49	.50
Economic status at age 7	.19	.28
Class background at age 7	.28	.27
School achievement at age 7	21.1	5.0

Note: Measures of emotional problems are standardized for comparability over time and across different measurement instruments (see p. 242); N = 11,759.

At ages 23 and 33, the cohort members were asked the 24 yes/no questions in the Malaise Inventory designed by Rutter et al. (1970). The Malaise Inventory is a screening instrument that captures a wide range of adult emotional disorders, such as depression, anxiety, phobias, and obsessions. Because depression is more prevalent in adult populations than other problems, the Malaise Inventory overrepresents items related to depression. The Malaise Inventory had an alpha reliability of .78 at age 23 and .81 at age 33. Table 1 presents the means and standard deviations of the variables used in the analysis.

METHODS

Growth-Curve Models

Growth-curve analysis models change over time in an attribute (outcome variable) for an individual. Theoretically, the model assumes

an underlying path of change in the attribute that is generally applicable to all individuals in the study, but it also allows particular characteristics or events (such as whether parents divorced) to modify that path. In our analyses, the outcome variable is emotional problems, which were measured at ages 7, 11, 16, 23, and 33.

Continuity over time in emotional problems is modeled at two levels. Level 1 consists of repeated observations of individuals over time. Let Y_{ti} be the score of person i on the outcome variable (an indicator of emotional problems) at time t, and let a_{ti} be the age of person i at time t. A linear growth curve for the outcome variable is modeled as follows (using the notation of Bryk and Raudenbush 1992):

$$Y_{ti} = \pi_{0i} + \pi_{1i} a_{ti} + e_{ti}, \qquad (1a)$$

for $i = 1, \ldots, N$ individuals. In this model, π_{0i} is a constant corresponding to an intercept for individual i, and π_{1i} is the linear slope associated with age at time t for individual i. The error term e_{ti} is usually assumed to be independently and normally distributed with a mean of 0 and a constant variance σ^2. Our Level 1 model can be written as:

$$\textit{Emotional problems}_{ti} = \pi_{0i} + \pi_{1i}(age - 7)_{ti} + e_{ti}. \qquad (1b)$$

We subtracted 7 from age so that the intercept parameter π_{0i} would be the expected level of emotional problems at the start of the observation period.

The unit of measurement in the level-1 model is not the individual but rather an *observation on an individual at one point in time*. The growth-curve method allows the analyst to estimate how characteristics of the individual modify the values of π_{0i} and π_{1i}. In other words, the method allows characteristics of the individual to alter the way in which the outcome variable changes over time. This modeling is done in a level-2 model for which the unit of observation is the individual, and the dependent variables are the π_{0i} and π_{1i} parameters themselves:

$$\pi_{0i} = \beta_{00} + \beta_{01} X_{1i} + \beta_{02} X_{2i} + \ldots + \beta_{0q} X_{qi} + r_{0i}, \text{ and} \qquad (2a)$$

$$\pi_{1i} = \beta_{10} + \beta_{11} X_{1i} + \beta_{12} X_{2i} + \ldots + \beta_{1q} X_{qi} + r_{1i}, \qquad (2b)$$

where the X_{qi} are measures of characteristics 1 through q for individual i, the coefficients β_{pq} are the effects of the characteristics on the π_{0i} slope and π_{1i} intercept parameters, and r_{0i} and r_{1i} are error terms that are assumed to be uncorrelated with the X_{qi} characteristics and are multivariate normally distributed with means of 0 and a covariance matrix **T**. The error terms represent unmeasured characteristics of individual i that do not change over time.

The β_{pq} coefficients are of greatest interest because they describe how variations in characteristics such as parental divorce, gender, or social class alter the growth curve for an individual by changing the values of the slope and intercept parameters. The unit of analysis in level 2 is the individual i, and the characteristics X_{qi} are invariant over time. Our key characteristic is the time-invariant measure of whether an individual ever experienced parental divorce. Estimates of the variance and covariance components of the growth-curve model were obtained by maximum-likelihood methods; estimates of the β_{pq} coefficients were obtained by generalized least squares (Bryk and Raudenbush 1992).[4]

The growth-curve model requires that the repeated measures of the attribute of interest, in this case emotional problems, be measured comparably at each point in time. Otherwise, the underlying path of change cannot be discerned. But if the span of time is long, such as the 26-year period between ages 7 and 33 in our case, comparable measures may not be possible. (For example, asking about reluctance to go to school is a good way to measure anxiety at age 7, but is inappropriate at age 33.) Consequently, to estimate a growth-curve model of emotional problems from age 7 to age 33, we standardized scores for the emotional-problems scale at each age to have a mean of 0 and a standard deviation of 1. This ensured comparability of measurement, but did so at a price. Given the standardization, the expected score for the average person at each age is 0 (see Table 1). In other words, the typical growth curve is a horizontal line, and the actual, unstandardized shape of the growth curve

[4] The HLM program was used to generate the estimates (Bryk, Raudenbush, and Congdon 1994).

cannot be observed. Although this is a serious limitation, we still can examine how the growth curve differs according to whether and when a parental divorce occurs. The level-2 model estimates the effects of divorce on the level-1 slope and intercept parameters. If parental divorce increases emotional problems at certain ages, the estimated growth curve for the group experiencing divorce should be above the curve for the group that did not experience divorce. We are thus estimating the effects of parental divorce on the growth curve *relative to* the path of those whose parents did not divorce.

To explore whether the standardization of emotional-problems scores influenced our findings, we redid our analyses using only the externalizing-disorders subscales at ages 7, 11, and 16. We also redid the analyses using only the internalizing-disorders subscales at ages 7, 11, and 16. The results were nearly identical to those we report below.[5] In addition, we conducted a regression analysis using just the age 23 and 33 data points, when the emotional-problems measures were identical and standardization was not necessary. We estimated regression equations in which the dependent variable was the change in the (logged) raw score of the Malaise Inventory between age 23 and age 33 and parental divorce was the key independent variable.[6] This regression using the raw difference-scores is equivalent to a growth-curve model with observations at only two time points.

Fixed-Effects Models

Random-effects models, including growth-curve models, have some limitations. Equations 2a and 2b assume that the unmeasured characteristics of individual i, represented by the error terms r_{0i} and r_{1i}, are not correlated with the measured characteristics, $X_{1i}, \ldots, X_{qi}$. Fixed-effects models do not require this assumption, and they also control for unmeasured characteristics that do not change over time (Allison 1994). Consider a single-level model of the form:

$$Y_{ti} = \alpha_i + \beta_1 X_{1ti} + \ \ldots \ + \beta_q X_{qti} + e_{ti}, \qquad (3)$$

where α_i is a fixed constant that differs for each individual i and represents unmeasured characteristics of that individual that do not change over time. If there are observations at more than two time points (as is the case in the NCDS), an individual's outcome score at each time point can be expressed as a deviation from his or her mean outcome score across all time points:

$$Y_{ti} - \overline{Y}_i = \beta_1\left(X_{1ti} - \overline{X}_{1i}\right) + \ \ldots \\ + \beta_q\left(X_{qti} - \overline{X}_{qi}\right) + \left(e_{1i} - \overline{e}_i\right). \qquad (4)$$

Measured variables that do not change over time drop out of equation 4 because the difference terms always equal 0 (which is why fixed-effects models cannot estimate the main effects of time-invariant variables such as gender and parental social class). Note that the a_i terms drop out of this equation (because a_i is constant over time), so that the model controls for time-invariant unmeasured characteristics. In our application, for every observation on an individual, the key variable on the right side of the equation is a binary variable coded 1 if a parental divorce has occurred for that individual at any time prior to the observation, and coded 0 otherwise.

Comparing the Models

Substantively, the main difference between the growth-curve and fixed-effects models in this application is in their treatment of the variables measuring parental divorce. In the growth-curve models, a set of dummy variables for age at parental divorce is taken as time-invariant. In other words, at each wave, a given individual has the same scores on the set of dummy variables (e.g., a divorce never occurred, a divorce occurred between ages 7 and 10, a divorce occurred between ages of 11 and 15, etc.), no matter whether the wave occurred prior to or after the divorce. This specification allows us to estimate and graph trajectories of mental health over the entire age range from age 7 to age 33 for individuals who experienced a divorce during a par-

[5] Results of these additional analyses are available upon request. In general, the subscales had lower reliabilities than the full scales (see Chase-Lansdale et al. 1995).

[6] We used the natural logarithms of the Malaise Inventory scores because they were more symmetrically distributed than the skewed untransformed scores.

Table 2. Effects of Selected Independent Variables on the Intercept and Slope Parameters of a Linear Growth-Curve Model Predicting Emotional Problems from Ages 7 to 33

	Dependent Variables			
	Intercept Parameter		Slope Parameter	
Independent Variable	Specification 1	Specification 2	Specification 1	Specification 2
Parental divorce between age 7 and age 22	.114*** (.0278)	—	.00536** (.00176)	—
Parental divorce between age 7 and age 10	—	.0761 (.0537)	—	.00620 (.00357)
Parental divorce between age 11 and age 15	—	.139*** (.0416)	—	.00418 (.00265)
Parental divorce between age 16 and age 22	—	.113** (.0472)	—	.00607** (.00285)
Parental divorce between age 23 and age 33	.0663 (.0574)	.0662 (.0574)	.000959 (.00347)	.000959 (.00347)
Gender	−.198*** (.0162)	−.198*** (.0162)	.0236*** (.00103)	.0236*** (.00103)
Economic status at age 7	−.268*** (.0488)	−.269*** (.0489)	−.00318 (.00313)	−.00318 (.00313)
Class background at age 7	.0432 (.0497)	.0435 (.0497)	−.00415 (.00316)	−.00414 (.00316)
School achievement at age 7	−.0172*** (.00188)	−.0172*** (.00188)	−.000439*** (.000121)	−.000439*** (.000121)
Constant	.485*** (.0397)	.485*** (.0397)	−.000735 (.00256)	−.000747 (.00256)
−2 Log-likelihood	—	—	136,613.5	136,647.0

Note: Numbers in parentheses are standard errors; N = 11,759.
*$p < .05$ **$p < .01$ ***$p < .001$

ticular age interval. Crucially, these trajectories, or growth curves, let us examine predisruption effects as well as postdisruption effects. The growth-curve specification also allows us examine the main effects of time-invariant variables such as gender and social class.

In the fixed-effects models, parental divorce is measured as a single time-varying dummy variable. At each wave, the variable is coded 1 if a divorce has occurred by that time, and 0 if it has not yet occurred (or has never occurred). The estimates from our fixed-effects models pertain only to postdisruption effects and cannot include the main effects of gender and parental social class background. However, the ability of the fixed-effects models to control for time-invariant unobserved variables suggests that these models may provide a stronger test of whether postdisruption effects exist.

FINDINGS

Growth-Curve Models

Because of the standardization of measures of emotional problems, the average values of the intercept and slope parameters are close to 0. However, a model that allows the intercept and slope parameters to vary about their average values from individual to individual fits the data better than a model that sets the intercept or slope to the same value for all individuals. The individual variation in the intercept and slope was modeled at level 2 as a function of whether (and when) the individual's parents divorced, and the individual's gender, economic status at age 7, class background at age 7, and school achievement at age 7.

Table 2 presents the estimated parameters from two specifications of the level-2 model. Consider specification 1. Column 1 shows

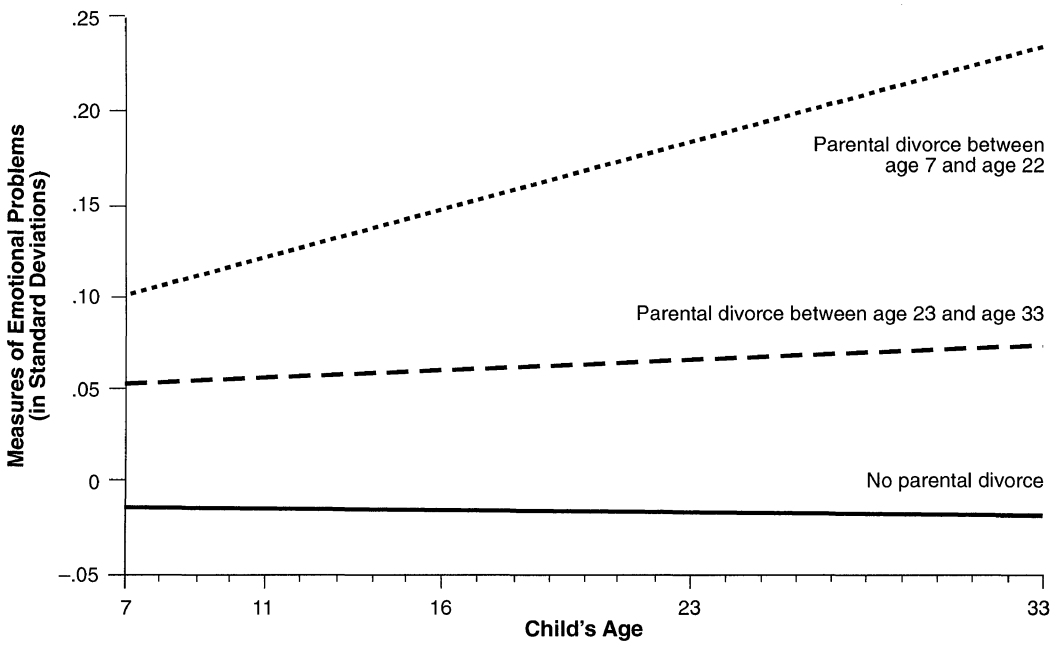

Figure 1. Linear Growth-Curve Model of Emotional Problems from Age 7 to Age 33, by Child's Age at Parental Divorce

Note: Measures of emotional problems are standardized to a mean of 0 and a standard deviation of 1 to allow comparisons over time among different measurement instruments.

the effects of the covariates on the intercept parameter—which is the expected level of emotional problems at age 7. Recall that none of the individuals in this analysis had experienced a parental divorce at age 7. Nevertheless, a parental divorce between ages 7 and 22 increases the intercept term by .114 standard deviations, compared to no parental divorce (the reference category). This statistically significant predisruption effect implies that persons whose parents later divorced already had emotional problems at age 7—before the divorces occurred.[7]

Column 3 shows the effects of the covariates on the slope parameter in specification 1. A parental divorce between ages 7 and 22 is significantly associated with an increased slope. Thus, the growth curves for the group whose parents divorced and the group whose parents did not divorce diverge after age 7; the curve for those whose parents divorced (by age 22) rises more rapidly.

Figure 1 presents the predicted growth curves for emotional problems based on specification 1 in Table 2. The predictions are for hypothetical individuals who differ on whether and when their parents divorced but who otherwise are average on all other measured characteristics.

The solid line represents the predicted path of emotional problems for the large group whose parents did not divorce. The path starts near 0 and shows no change because of the standardization of our measures, which ensured that the typical person has a score near 0 at each time point. We cannot determine the shape of the unstandardized growth curve. Note, however, that the line for the children whose parents divorced when they were between age 7 and age 22 begins with a higher level of predicted emotional problems at age 7. Note also that the gap between the no-divorce group and persons whose parents divorced between ages 7 and 22 is wider at the end of the study than at the beginning because predicted emotional problems have increased for the divorced group. Thus, a difference in emotional problems is predicted at age 7, before divorce oc-

[7] Women had a lower predicted intercept than men, probably reflecting a lower level of externalized behaviors (fighting, disobedience) in girls than in boys.

curs; but in addition the group that experienced divorce is predicted to experience a further increase in emotional problems relative to those whose parents never divorced.

As for those whose parents divorced when they were between ages 23 and 33, they begin with a level of emotional problems that is slightly above the no-divorce group, although Table 2 shows that this difference is not statistically significant. They show no further increase in emotional problems relative to the no-divorce group.

To pursue possible effects of the timing of divorce, we divided the single binary variable for divorce between age 7 and age 22 into three binary variables to reflect the interview dates: divorce between age 7 and age 10, divorce between age 11 and age 15, and divorce between age 16 and age 22. This is specification 2 in Table 2. A likelihood-ratio test indicates that specification 2 fits the data better than specification 1 ($\chi^2 = 23.5$, d.f. = 6, $p < .001$). The results allow us to examine the predisruption effect more closely. Parental divorces that occurred during adolescence and young adulthood—between age 11 and age 22—were associated with significantly higher levels of emotional problems at age 7. If the predisruption effect at age 7 merely reflects parental conflict just before a divorce, then we would expect persons who experienced a parental divorce between age 7 and age 10 to have significantly higher initial levels of emotional problems because the age 7 to 10 interval is closest to age 7, but this expectation is not borne out. Apparently, the predisruption effect of a parental divorce at age 7 is not simply a result of the start of the divorce process. Rather, it may reflect unmeasured characteristics of the individual or the parents that influenced both early emotional problems of the child and the subsequent divorce of the parents.

To investigate whether the effect of a divorce in childhood or adolescence on emotional problems changes after age 23, we first tried to estimate a quadratic growth-curve model. Our data, however, did not support this model.[8] Consequently, we turned to a difference-score regression model of change between age 23 and age 33. This is equivalent to a two-period growth-curve model. The outcome variable is the difference between the natural logarithm of the Malaise Inventory score at age 33 and the natural logarithm of the Malaise Inventory (MI) score at age 23:

$$\ln(MI_{age\ 33})_i - \ln(MI_{age\ 23})_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_q X_{qi} + e_i ,$$

where $X_{1i}, \ldots, X_{qi}$ are the same covariates used in specification 1 of Table 2. Because the outcome instrument was identical at the two time points, standardization of scores was not necessary. The results (not shown) indicate that a parental divorce between age 7 and age 22 is associated with a significant increase in Malaise Inventory scores between age 23 and age 33. These results suggest that the mental health of adults who experienced parental divorce in childhood or adolescence continued to diverge through their twenties and early thirties from the mental health of adults whose parents did not divorce. This finding did not change when, in an attempt to control for predisruption characteristics, we included the emotional problems scale score at age 7 as an additional independent variable. Thus the finding is not simply a reflection of early, predisruption indicators of emotional problems.

Fixed-Effects Models

The rising slope for emotional problems among children of divorced parents evident in Figure 1 is consistent with a postdisruption effect of parental divorce on emotional problems. Yet the rising slope also could be caused by unmeasured characteristics that are correlated with both parental divorce and levels of emotional problems that increase as a person enters adolescence and adulthood. Using fixed-effects models, we can examine the effects of parental divorce controlling for time-invariant unmeasured characteristics.

Table 3 shows that if, at a given observation point, a parental divorce has occurred to

[8] The algorithm converged with difficulty, and diagnostics suggested that the results were questionable. With only five data points per person, it may be asking too much of the data to fit a quadratic model that requires three parameters—an intercept, a linear slope, and a quadratic slope.

Table 3. Fixed-Effects Estimates of the Effect of a Parental Divorce and Other Time-Varying Characteristics on Emotional Problems

Independent Variable	Effect (β)
Age	.000248
	(.000448)
Parents have ever divorced	.0983***
	(.0265)

Note: Numbers in parentheses are standard errors; N = 11,759.

***$p < .001$

an individual, his or her level of emotional problems was about .1 standard deviations higher than his or her average level of emotional problems across all observation points; this difference is statistically significant at the $p < .001$ level. This result increases our confidence that there is an ongoing effect of a parental divorce. That is, the apparent mental health effect of a parental divorce is not simply a result of unmeasured time-invariant characteristics of the individual and her or his family, but is due to the divorce itself.

DISCUSSION

A previous study found that much of the apparent effect of a parental divorce on children's emotional problems between ages 7 and 11 could be attributed to characteristics of the child and family prior to the divorce (Cherlin et al. 1991). The present study suggests, however, these earlier finding should be modified. To be sure, we found evidence that part of the difference in emotional problems between the divorce and no-divorce groups at age 33 can be attributed to predivorce characteristics at age 7: A difference of .11 standard deviations already existed at age 7 between individuals whose parents later divorced by age 22 compared to individuals whose parents remained together until their children were at least age 33. But as the subjects aged, the difference between the two groups widened: By the time cohort members were 33 years of age, the difference had expanded to .25 standard deviations.[9] This widening suggests that the divorce and its aftermath may have effects that persist into adulthood (although some time-varying predisruption characteristics that weren't fully measured may have widened the gap after age 7).

If the continuing effect were a result of the divorce rather than unmeasured factors, it would suggest that this childhood event can set in motion a chain of circumstances that affects individuals' lives even after they have left home, married, and entered the labor force. The exact nature of these continuing effects cannot be determined from the NCDS data.[10] The absence of a strong post-disruption effect at age 11 (Cherlin et al. 1991) suggests that the long-term effect may emerge only in adolescence or young adulthood (Chase-Lansdale et al. 1995). Parental divorce could trigger events such as early childbearing or curtailed education that, in turn, affect adult outcomes (Wu, Cherlin, and Bumpass 1996). Or parental divorce could be, in part, a marker for individual characteristics that hinder adult development. In any case, the NCDS data suggest that the life courses of individuals whose parents divorce continues to diverge in adulthood from the life courses of those whose parents do not divorce.

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[9] These figures are derived from specification 1 in Table 2. Recall that age minus 7, not age itself, was used in these equations. The effect of parental divorce on the intercept of the level-1 equation is .114, which yields the gap at age 7. The gap at age 33 equals .114 + [.0054(33 – 7)], where .0054 is the effect of divorce on the slope of the level-1 equation.

[10] The NCDS data also did not allow us to examine potentially important sources of variation, such as parental remarriage or the frequency of contact with the noncustodial parent.

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