The Short-Term and Decade-Long Effects of Divorce on Women's Midlife Health*

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We hypothesize that divorce immediately increases psychological distress and has long-term negative consequences for the physical health of divorced people. In addition, we hypothesize that divorce indirectly causes long-term increases in distress through stressful midlife events. The hypotheses are tested using data from 416 rural Iowa women who were interviewed repeatedly in the early 1990s when they were mothers of adolescent children; the women were interviewed again in 2001. The data support the hypotheses. In the years immediately after their divorce (1991–1994), divorced women reported significantly higher levels of psychological distress than married women but no differences in physical illness. A decade later (in 2001), the divorced women reported significantly higher levels of illness, even after controlling for age, remarriage, education, income, and prior health. Compared to their married counterparts, divorced women reported higher levels of stressful life events between 1994 and 2000, which led to higher levels of depressive symptoms in 2001.

Divorce is one of the most pervasive personal disruptions in Western culture. Although divorce rates in the United States have been dropping since the 1970s "decade of divorce" (Goldstein 1999; McManus and DiPrete 2001), they remain higher than in most European countries (Kirasic 2004) and dramatically higher than the rates reported in earlier eras (Mintz and Kellogg 1988). Divorce among parents is a special policy concern because single motherhood (or absent fatherhood) is often cited as an important cause of crime, delinquency, and community decline (Popenoe 1996). At the individual level, divorce is associated with economic hardship, social isolation, and risky health behaviors among both adults and children (Morrison and Ritualo 2000; Peterson 1996). Divorce has long been linked to physical and emotional health problems (Avison 1999; Simon and Marcussen 1999).

Scholars have made remarkable progress in synthesizing knowledge about the dynamics of marriage and the consequences of divorce (Amato 2000; Gottman 1994; Karney and Bradbury 1995). In the process, they have isolated continuing points of inquiry common to both health and family sociologists, two of which are addressed in this study. One is whether divorce is better understood as an acute stressor or as a chronic stressor. Some

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studies suggest that divorce is a temporary crisis to which most people adapt within two or three years (Kitson 1992; Lorenz et al. 1997), while others see it as a persistent chronic state (Johnson and Wu 2002).

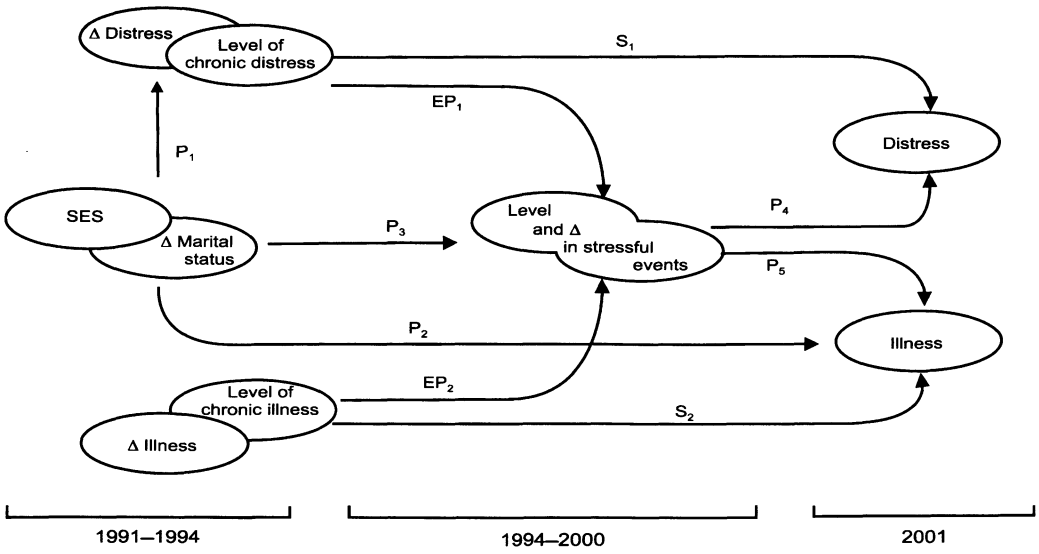
The second point of inquiry focuses on differences in the timing and duration of psychological distress and physical health problems in the years after divorce. Studies have shown that divorce has large effects on psychological distress but smaller effects on physical health (Avison 1999; Rogers 1996), perhaps because physical illnesses accumulate slowly over time in response to divorce's chronic dimension. Direct comparisons of the changes in distress and illness are seldom made, however, because modeling change requires longitudinal data and because most previous studies have not included both outcomes in a single model.

This study traces the decade-long (1991–2001) effects of divorce on the psychological distress and physical illness of a panel of 416 women who were mothers of ninth graders in 1991. In the process, we delineate several hypotheses. The first is that *getting a divorce* is disruptive and elevates the psychological distress of family members. Over longer periods of time, however, *the experience of being divorced* leaves many individuals, especially mothers, in chronically disadvantaged social and economic circumstances, and these chronic circumstances have cumulative adverse effects on physical health. The third hypothesis argues that divorce also has longer-term effects on psychological distress, but these effects are primarily indirect through the stressful life events to which the divorced are especially susceptible.

THEORETICAL PERSPECTIVE AND CONCEPTUAL MODEL

A number of perspectives have been proposed to understand the consequences of divorce for individuals, including life course (Amato and Booth 1997) and crisis theories (Raschke 1987; Turner and Avison 1992). One approach that resonates with many health and family sociologists is the divorce-stress-adjustment perspective (Amato 2000), which views divorce as a process that begins with feelings of estrangement from one's spouse, continues as one or both spouses decide to separate, and then is followed by adjustment after divorce. This perspective shares much with the broader "stress-distress" paradigm in health sociology by conceiving of divorce as a stressor to which individuals adapt with varying degrees of resilience, depending in part on the social and economic resources at their disposal (Pearlin et al. 2005; Turner and Lloyd 1999). The application of this perspective to our study design is outlined in Figure 1, where time is divided into three segments: 1991–1994, when the first three waves of data were collected; 1994–2000, the years covered by an event history calendar; and 2001, when the most recent

FIGURE 1. Theoretical Divorce-Stress-Adjustment Model



wave of data was collected. In Figure 1, the overlapping ellipses associated with illness (1991–94), distress (1991–94), and stressful life events (1994–2000) signify that each of these three concepts has chronic and change components; we will estimate each of these components.

Asymmetric Effects of Divorce on Distress and Illness

One distinctive contribution of the divorce-stress-adjustment perspective is that it identifies two competing models of adjustment after divorce. The *crisis model* views divorce as a disturbance from which most people recover, whereas the *chronic stress model* sees divorce as a major role change that ushers in new levels of chronic stress, especially among single mothers. These two models of adjustment have parallels in the distinction between acute and chronic stress as articulated by the stress-distress paradigm, and they suggest a fundamental distinction between the relatively short-term and long-term effects of divorce on psychological distress and physical illness. Specifically, Wheaton (1996:44–47; especially Figure 2) defined acute events—such as getting divorced—as stressors with identifiable beginnings and endings. In its idealized form, the intensity of an acute event is presumed to peak quickly and then recede precipitously. Psychological distress is expected to follow a similarly ephemeral pattern in response, rising quickly and then atrophying over time (Aneshensel 1999). Our first hypothesis builds on the crisis model of adjustment:

Hypothesis 1: Trajectories of psychological distress correspond closely to the event of getting a divorce, rising quickly as the divorce unfolds and then declining as it recedes into the past.

The presence of path P_1 (see Figure 1) but the absence of a path from change in marital status (Δ marital status) to level and change in illness (1991–1994) reflects this hypothesis.

Chronic stressors, such as those associated with being a single mother, are less "time-limiting" than acute events (Wheaton 1996), and decades of research has demonstrated that chronic stress can have cumulative effects on physical health through an interconnected set of cardiovascular, neurological, and immunological mechanisms most recently summarized by Lovallo (2005). Chronic stressors may increase the number of acute physical ailments one experiences (Cohen et al. 1998), and these may come and go, but chronic stress may also accelerate the onset of chronic physical health conditions such as heart and respiratory ailments, diabetes, and hypertension (Freemont and Bird 2000; Wickrama et al. 2001). Many of these conditions take years to develop and then do not disappear when the source of chronic stress disappears.

For many women, divorce signals the onset of chronic disadvantage caused by the social isolation and economic hardship incumbent upon the role of single mother (Johnson and Wu 2002; Wu and Hart 2002). Family incomes of divorced women are estimated to be 13 to 35 percent lower than for married women (Holden and Smock 1991; Peterson 1996), even when there were no income differences between women in the two groups before the separation (Simons 1996). Single mothers also report more health problems than do married mothers (Adler et al. 1994; House et al. 1994). Thus, our second hypothesis, represented by path P_2 in Figure 1, is as follows:

Hypothesis 2: Being divorced has long-term negative consequences for physical health that are not immediately visible but become visible later in life.

In contrast, we do not expect divorce to have a direct effect on psychological distress a decade later.

The Mediating Effects of Stressful Life Events

One difficulty facing researchers is distinguishing changes in psychological distress and physical illness that are due to divorce from changes that are due to the accumulation of more proximal events for which divorce can be a catalyst. Recently divorced mothers must often take on new jobs or increase their hours on existing jobs. In rural areas, these may be marginal or low-paying jobs in industries that provide few benefits. Divorce frequently entails moving to an inferior residence, which may leave one vulnerable to costly home repairs. The children of recently divorced mothers are more likely to change schools, and changing schools may lead to academic and social adjustment problems, dropping out of

school before graduating, associating with deviant peers, and delinquent behaviors (Chiriboga et al. 1991; Kitson 1992; Simons and Chao 1996). Thus, we expect the average number (level) of stressful life events to be higher among divorced women than among married women five to 10 years after divorce, with the rate of accumulation of these events possibly even accelerating over time. This hypothesized proliferation of stressful events in the years following divorce is indicated by path P_3 in Figure 1.

The proliferation of stressful midlife events because of divorce has two consequences implied by paths P_4 and P_5. First, most of the effects of divorce on psychological distress a decade later are expected to be felt indirectly through the more proximal stressful midlife events (1994–2000), especially more recent events. Second, the total effect of divorce on physical illness in 2001 is expected to be significant, but some of the total effect may be indirect (P_3*P_5). More recent stressful events are not expected to have as dramatic an effect on physical illness as they are on psychological distress; instead, illnesses in 2001 are expected to be more reactive to the persistent level of the stressful midlife events that occurred between 1994 and 2000. To test this possibility, path P_3 combines with paths P_4 and P_5 in Figure 1 to form the third hypothesis:

Hypothesis 3: Change in status from married to divorced leaves many mothers susceptible to an accumulation of stressful life events that elevate distress and undermine physical health.

The two autoregressive (stability) paths S_1 and S_2 in Figure 1 explicitly acknowledge that change in physical health unfolds over time, simply as a function of earlier health conditions; similarly, long-term levels of psychological distress may be overwhelmingly trait-like. Paths EP_1 and EP_2 compete with path P_3 in explaining level of and change in stressful events. These paths reflect what Lin and Ensel (1989) have referred to as the "event proneness" hypothesis. This hypothesis acknowledges that life events effect change in physical health and psychological distress (paths P_4 and P_5), but it adds that *stressful life events are themselves susceptible to prior physical and emotional health conditions, especially their chronic dimensions.* Individuals who enter midlife with persistently high levels of illness may be particularly susceptible to stressful midlife events, so that at least some of the observed continuity in illness over time may be indirect. Likewise, some of the persistence in psychological distress over a decade may be mediated through stressful midlife events. Chronically ill or chronically distressed women may miss more work or be overlooked for promotions; they may have less energy to devote to their families or to maintaining supportive relationships; and their own physical limitations may make them more susceptible to disabling injuries that further undermine health. Their children may get into trouble more often, in part because single mothers are less physically and emotionally able to guide and monitor their children.

METHODS

Sample: The Iowa Studies

The data used to evaluate the hypotheses are from the Iowa Midlife Transitions Project (MTP), a decade-long panel study of 484 rural families from a cluster of eight counties in north central Iowa that closely mirror the economic diversity of the rural Midwest. These families were originally part of the Iowa Youth and Families Project (IYFP) (Conger and Elder 1994) and the Iowa Single Parent Project (ISPP) (Simons 1996). The IYFP began in 1989 as a study of rural couples and two children per couple, at least one of whom was a seventh grader in 1989. The ISPP was integrated into the IYFP two years later by adding 102 recently divorced mothers and two children per mother, at least one of whom was a ninth grader in 1991. Families meeting the selection criteria were enumerated through contacts with public and private schools and then randomly selected and recruited into the study, with 78 percent of the married couples and 99 percent of the single mothers agreeing to participate (Conger and Elder 1994; Simons 1996). The 416 families in this study are those who participated in the MTP in 1991, 1992, 1994, and 2001 (86% of the 484).

The IYFP and ISPP were designed as community epidemiology studies in which families were sampled from relatively homogeneous subpopulations and then monitored to see how variation in key variables within the subpopulation affected the diverging developmental

paths of family members (Kellam 1990). In our case, the subpopulation was rural America in the wake of the financial "farm crisis" of the late 1980s, and the key variables are measures of economic hardship. Although the farm crisis affected rural areas across the nation, there was considerable variation in the extent to which families experienced economic hardship: Many were untouched, but others were devastated by loss of farm or agricultural jobs (Conger and Elder 1994).

Measures of Concepts

Table 1 provides summary statistics for the variables used to measure the concepts outlined in Figure 1. Chronicity and change in illness between 1991 and 1994 and illness in 2001 are calculated from counts of illness. The first rows of data in Table 1 report the number of illnesses women recorded between 1991 and 1994, and again in 2001. At each wave of data collection, respondents were presented with a list of 46 health conditions and asked whether they "had any problems with any of the symptoms or diseases listed" during the past 12 months. The illnesses ranged from relatively minor conditions such as the common cold and sore throats to more severe diseases such as heart conditions, diabetes, and cancer. Of the 46 conditions, three—depression, anxiety reaction, and nervous breakdown—were removed from the list to avoid contamination with depressive symptoms. From among the remaining 43 conditions, the sample as a whole averaged 3.48 illnesses in 1991, as shown in the first column of numbers in Table 1. That count decreased slightly to 3.34 in 1992, then increased to 4.09 in 1994, and decreased again to 2.94 in 2001. Most of the decline in illnesses in 2001 is due to fewer reported "common illnesses" such as colds and sore throats. The next two pairs of columns in Table 1 compare married and divorced women. The F-ratios, with 1 and 414 degrees of freedom, indicate that the counts of illnesses were significantly higher for divorced women in 1991 and 2001.

Chronicity and change in distress (1991–1994) and distress in 2001 were measured by 12 depressive symptoms items in the Symptoms Checklist (SCL-90-R; Derogatis 1983). A preamble that ended by asking, "During the past week, how much were you distressed or bothered by . . ." was followed by a list of items such as "feeling low in energy or slowed down," "thoughts of ending your life," and "feeling lonely." Each item was scored on a scale from not at all (1) to extremely (5). The items were summed and divided by 12 so that the index ranged from 1 to 5. The index had

TABLE 1. Descriptive Statistics for Married and Divorced Women

	Total (N = 416)		Married (N = 336)		Divorced (N = 80)		
Variable	Mean	SD	Mean	SD	Mean	SD	F-ratio
Number of illnesses							
1991	3.48	2.36	3.33	2.16	4.11	3.01	7.13*
1992	3.34	2.26	3.24	2.13	3.76	2.70	3.47
1994	4.09	2.77	4.00	2.67	4.48	3.13	1.88
2001	2.94	2.36	2.72	2.09	3.84	3.11	14.93*
Depressive symptoms							
1991	1.56	.60	1.50	.57	1.80	.63	17.66*
1992	1.51	.57	1.47	.54	1.65	.66	6.28*
1994	1.60	.59	1.58	.57	1.69	.63	2.53
2001	1.54	.54	1.53	.50	1.62	.68	1.75
Number of stressful life events							
1994	.69	1.34	.64	1.28	.95	1.55	3.60
1995	.91	1.32	.84	1.21	1.28	1.69	7.69*
1996	1.07	1.49	1.00	1.39	1.35	1.85	3.59
1997	1.13	1.37	1.02	1.30	1.60	1.57	11.81*
1998	1.19	1.75	1.04	1.65	1.82	2.01	13.36*
1999	1.36	1.57	1.20	1.44	2.04	1.86	19.47*
2000	1.66	1.91	1.52	1.78	2.23	2.28	8.90*
Age in 1991	39.9	3.97	40.1	4.05	39.3	3.58	2.33
Years of education	13.6	1.70	13.5	1.71	13.4	1.63	.72
Family income 1991 (in $1,000s)	37.3	30.0	41.4	30.6	20.3	19.8	34.60*

* $p \leq .05$

internal consistency estimates of reliability of .91 in 1991, 1992, and 1994, and .90 in 2001. Divorced women reported significantly higher depressive symptoms scores than did married women in 1991 and 1992, but the difference was smaller in 1994 and still smaller in 2001.

The number of stressful midlife events was obtained in 2001 by presenting all respondents with an event history calendar. The calendar provided an extensive list of events that were classified into mutually exclusive categories according to whether the events best related to work (e.g., got laid off), marriage and relationships (e.g., separated due to work), children (e.g., dropped out of high school), or self (e.g., had a serious injury). Two items—became ill with a life-threatening disease and saw a doctor about an emotional problem—were deleted from the list because of possible contamination with the measures of illness and depressive symptoms. Interviewers began by administering a brief "memory helper timeline" to help respondents recall the timing of salient events (e.g., significant birthdays, marriages, anniversaries). Then, for each domain, interviewers presented the respondent with the list of possible events and asked whether each event occurred one or more times and in what years. As indicated in Table 1, the number of events reported increased steadily over time, perhaps in part because respondents are more likely to recall more recent effects. Even so, the average number of events recorded by divorced women was higher than the number reported by married women in each year between 1994 and 2000.

Three socioeconomic variables—age, education, and family income—were included as potentially important controls (e.g., Karney and Bradbury 1995). In 1991, the respondents averaged 39.9 years of age (88% were between 45 and 56 in 2001) and had completed an average of 13.6 years of school. Family income among the divorced women ($20,300) was only about half the amount reported by married women, even though predivorce family income for the divorced women was not significantly different from that of the married women (Simons 1996). Family income correlated –.139 with chronic illness and –.278 with marital status, where marital status is dichotomized so that divorce (change in status) is coded 1 and married (the reference group) is 0.

RESULTS

The analyses begin by estimating univariate growth curves, signified by the overlapping ellipses in Figure 1. Growth curves separate chronic levels of distress, illness, and stressful events from their change components, which is important when evaluating the hypotheses. The second step examines the first two hypotheses by comparing the short-term (1991–1994) and decade-long (1991–2001) effects of divorce on changes in illness and depressive symptoms. Finally, the model in Figure 1 is estimated to determine the extent to which the total effects of divorce on distress and illness are mediated through stressful midlife events.

Because of concerns about bias due to attrition between 1991 and 2001, we compared those who provided complete data (N = 416) with those who dropped out of the panel or had missing data (N = 68). Women originally from the IYFP sample were more likely to stay in the study (86% retention) than the ISPP women (79% retention). Those who dropped out of the panel were younger (38.7 vs. 39.9 in 1991) and less well educated (12.7 vs. 13.5 years of school). Those who dropped out had significantly lower per capita family incomes in 1991 ($7,056 vs. $8,503), in 1992 ($6,825 vs. $8,774), and in 1994 ($8,683 vs. $11,555). Those who dropped out of the study also reported more illnesses in 1992 (4.2 vs. 3.3). There were no significant differences between the two groups in their reports of depressive symptoms.

Estimating Univariate Growth Curves

Conceptually speaking, growth curve estimation begins by constructing line segments describing intraindividual change for each individual in the study (Duncan et al. 1999; Singer and Willett 2003). Expressed as a linear regression for the *i*th woman at t points in time, a linear relationship between an outcome (y) and time is of the form

$$y_{it} = \pi_{0i} + \pi_{1i}t + \varepsilon_{it}$$

where π_{0i} and π_{1i} are the *i*th woman's intercept and slope, respectively. Because each mother has a different intercept and a different slope, their linear line segments can be aggregated to obtain an average intercept and an average

slope, each with a variance. This aggregate linear function can then be compared to alternative functional forms. For example, this model can be compared to a model where there is significant nonlinear change over time, the most common example of which is the quadratic ($y_{it} = \pi_{0i} + \pi_{1i}t + \pi_{2i}t^2 + \varepsilon_{it}$).

For our data, the results from fitting linear growth curves to three waves of physical illness and depressive symptom data (1991, 1992, and 1994) and to seven years of stressful midlife events (1994–2000) are summarized in Table 2. For illness and depressive symptoms, the intercepts were arbitrarily set to correspond to 1992. Thus, the intercept of 3.31 in the equation

$$\hat{y}_t = 3.31 - .158t \qquad t = -1, 0, 2$$

is an estimate of the average number of illnesses reported by all respondents in 1992 (compared to the observed average of 3.34 in Table 1). The slope of –.158 implies that the count of illnesses decreased, on average, between 1991 and 1994. More importantly, the variance of the slope is a significant .122, as indicated by the *t*-ratio of 2.85. This means there is significant interindividual variation in change across time: Some individuals reported increases in their number of illnesses, while others reported declines, and some have declined more dramatically than others. The small chi-square (χ^2 (2) = .28) indicates that the model fits the data. The growth curve for depressive symptoms can be similarly interpreted.

For stressful midlife events recorded in 2001 for the years between 1994 and 2000, the linear growth curve is expressed as:

$$\hat{y}_t = .87 + .137t \qquad t = -1, 0, 1, 2, 3, 4, 5.$$

Thus, the predicted value in 2000 is 1.55 (.87 + (.137 * 5)), compared with an observed 1.66. The linear model fits the data (χ^2 (21) = 28.5), and no significant improvements were made by fitting other functional forms such as the quadratic.

Asymmetric Effects of Divorce on Depressive Symptoms and Physical Illness

The six columns of estimates in Table 3 report the intercepts (level) and slopes (change) of depressive symptoms and counts of illnesses between 1991 and 1994, and the level of depressive symptoms and illnesses in 2001. The first predictor variable, "divorced" (1989–1990), distinguishes between married (coded 0) and divorced (1) women. To control for the possible confounding effects of change in status after 1991, the women were further subdivided to take into account the 40 divorced women who "recoupled" (either by remarrying or cohabiting) sometime between 1991 and 2001 ("divorced; recoupled" in Table 3) and the 23 married women who divorced ("married; divorced").

The results in the table support the asymmetric effects proposed in the first two hypotheses. Women who divorced between 1989 and 1990 had significantly higher levels (intercept) of depressive symptoms in 1992 (.035; t = 2.86) than those who were married, but their slope of depressive symptoms declined significantly between 1991 and 1994 (–.011; t = –2.49). Conversely, "divorced" (1989–1990) was not significantly related to either the level of physical illnesses in 1992 (.071; t = 1.43) or its slope (–.014; t = –0.79).

Consistent with the second hypothesis, "divorced" (1989–1990) was not significantly related to depressive symptoms in 2001 (–.014; t = –1.19), but it was significantly related to physical illness in 2001 (.118; t = 2.62). The significant change in illness over a

TABLE 2. Univariate Growth Curves

	Intercept		Slope		
Variable	Mean	Variance	Mean	Variance	Chi-square (df)
Illness (1991–1994)	3.31	3.582	–.158	.122	.28 (2)
	(30.6)	(11.9)	(–1.98)	(2.85)	
Depressive symptoms (1991–1994)	1.51	.205	–.049	.006	.06 (2)
	(54.5)	(11.6)	(–2.07)	(1.96)	
Stressful life events (1994–2000)	.87	.571	.137	.039	28.5 (21)
	(18.3)	(8.38)	(9.25)	(5.66)	

Note: t-ratios in parentheses.

decade is estimated not only after controlling for the stability of earlier levels of illness (.900; t = 15.0) but also by controlling for chronic depressive symptoms, age, education, and family income, as well as by taking into account subsequent changes in status during the decade, either from married to divorced or from divorced to recoupled.

Although the other predictor variables were added primarily as controls, they too add to our understanding. First, as expected, the average level of per capita family income between 1991 and 1994 predicted significantly lower depressive symptoms (–.014; t = –2.75) and lower levels of illness (–.065; t = –3.23) in 1992. This is congruent with previous studies linking both psychological distress and physical health to gradients of socioeconomic status, of which income is one important dimension (Adler et al. 1994; House et al. 1994). The lack of significant coefficients associated with age and education probably reflects the relative homogeneity of this midlife sample; nearly all respondents are high school graduates, but relatively few have more than a college degree.

Second, when the divorced women were divided into two groups (divorced vs. recoupled), there was no significant difference in level of illness between those who recoupled and those who stayed single (i.e., $p > .05$). However, the 23 IYFP women who divorced during the decade, when contrasted to the other 313 IYFP mothers who stayed married, reported consistently higher levels of depressive symptoms (.025; t = 3.44) and somewhat higher levels of illness (.048; t = 1.64) throughout the early 1990s. Then, between the early 1990s and 2001, they recorded more rapid declines in their levels of both depressive symptoms (–.012; t = –1.70) and physical illnesses (–.065; t = –2.46), at least relative to the continuously married. This group of divorced women is small, and their divorces are scattered over the decade, so we are careful not to infer too much from this finding. However, they appear to follow the pattern of relief we attribute to the crisis model of divorce adjustment rather than to the chronic stress model, which would have predicted an increase in illness.

Effects of Family Structure on Midlife Events

The third hypothesis proposes stressful midlife events as one pathway whereby change in status can be expected to effect change in depressive symptoms and illness over a

TABLE 3. Unstandardized Maximum-Likelihood Estimates (with *t*-ratios) Linking Level of and Change in Psychological Distress and Physical Illness to Predictor Variables, Including Marital Status and Change in Marital Status

	Depressive Symptoms		Physical Illness		Total Effects	
Predictor Variables	Intercept (1992)	Slope (1991–1994)	Intercept (1992)	Slope (1991–1994)	Depressive Symptoms (2001)	Physical Illness (2001)
Divorced (1989–1990)[a]	.035*	–.011*	.071	–.014	–.014	.118*
	(2.86)	(–2.49)	(1.43)	(–.79)	(–1.19)	(2.62)
Divorced; recoupled	–.006	–.012	.229	.067	.032	.225
	(–.11)	(–.67)	(1.08)	(.89)	(.65)	(1.19)
Married; divorced	.025*	.001	.048	.010	–.012	–.065*
	(3.44)	(.57)	(1.64)	(.93)	(–1.70)	(–2.46)
Age in years (1991)	–.004	.002	.021	–.006	–.006	–.008
	(–.66)	(.68)	(.82)	(–.62)	(–.93)	(–.34)
Education in years (1991)	.014	.009	.087	.035	–.019	.065
	(.92)	(1.68)	(1.37)	(1.54)	(–1.27)	(1.15)
Per capita family income	–.014*	.000	–.065*	–.005	.000	–.027
(1991–1994)	(–2.75)	(–.26)	(–3.23)	(–.64)	(.03)	(–1.57)
Level of depressive symptoms (1991–1994)					.632*	–.342
					(9.45)	(–1.37)
Level of illness (1991–1994)					–.340	.900*
					(–1.37)	(15.0)
Intercept	1.65	–.163	1.880	.193	.957	.169
	(6.03)	(–1.71)	(1.70)	(.49)	(3.46)	(.16)
R-squared	10.3%	30.9%	6.0%	3.5%	33.9%	52.8%

* $p \leq .05$

[a] Married is the reference group.

decade. The first step in evaluating this mediating argument is to examine path P_3 in Figure 1. Evidence supporting this pathway, as well as paths EP_1 and EP_2, is in the first two columns of estimates in Table 4. Three distinctive patterns emerge. First, although "divorced" (1989–1990) is only modestly related to the level of stressful events reported in 1995 (.036; t = 1.68), it is significantly related to an increase in the slope of stressful events between 1994 and 2000 (.017; t = 2.18). When taken together, these two coefficients suggest that differences in stressful events experienced by married and divorced women earlier in the decade (1995) became more divergent at the end of the decade.

Second, the significant effect of chronic illness (.100; t = 3.54) on the level of stressful midlife events reported for 1995 is evidence supporting Lin and Ensel's (1989) event proneness hypothesis, which argues that having chronically elevated illness leaves one susceptible to new stressful life events. The same pattern links chronically elevated depressive symptoms to higher levels of stressful events, to a slightly weaker degree (.295; t = 2.33). In neither case, however, was there a significant effect on the slopes. Overall, this suggests that the chronic dimensions of illness and depressive symptoms elevate the chronic levels of later stressful life events, but they do not seem to accelerate the formation of stressful events over the interval between 1994 and 2000, as did divorce.

Finally, the pattern of change in stressful midlife events for the four distinct marital-status groups is suggestive of the impact of volatile relationships on the formation of stressful events. As demonstrated in Figure 2, the continuously married women stand out as distinctive from the other three groups; they consistently reported fewer stressful midlife events throughout the years 1994 to 2000. The other three groups—all of whom experienced at least one marital status change, either before the beginning of the study or during the decade—all reported consistently higher levels of stressful events. Although the sample sizes

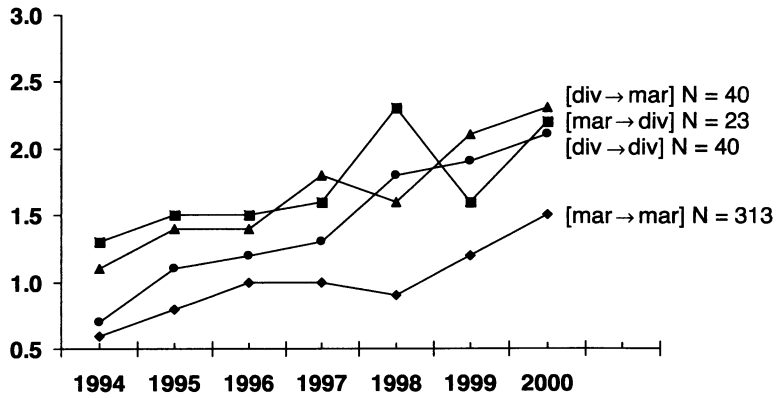
TABLE 4. Unstandardized Maximum-Likelihood Estimates (with *t*-ratios) of Relationships among Marital Status, Chronic Illness, and Health Outcomes (N = 416)

	Stressful Life Events			
Predictor variables	Level (1995)	Slope (1994–2000)	Depressive Symptoms (2001)	Physical Illness (2001)
Divorced (1989–1990)[a]	.036	.017*	–.029*	.083
	(1.68)	(2.18)	(–2.39)	(1.82)
Divorced; recoupled	.169	–.025	.030	.186
	(1.79)	(–.79)	(.59)	(.98)
Married; divorce	.037*	–.001	–.015*	–.080*
	(2.81)	(–.27)	(–2.12)	(–2.95)
Age	–.021	.002	–.004	–.001
	(–1.84)	(.41)	(–.65)	(–.03)
Education (years)	–.002	–.003	–.015	.073
	(–.29)	(–.31)	(–1.02)	(1.30)
Family income ($1,000) (1991–1994)	–.006	.001	–.002	–.026
	(–.62)	(.35)	(–.34)	(–1.49)
Chronic illness	.100*	.009	.014	.841*
(1991–1994)	(3.54)	(.90)	(.92)	(13.71)
Depressive symptoms	.295*	.002	.609*	–.471
(1991–1994)	(2.33)	(.06)	(8.83)	(–1.83)
Stressful life events				
Level			.109*	.432*
			(2.18)	(2.29)
Slope			.582*	1.268
			(3.14)	(1.82)
Intercept	1.09	.071	–.406	.787
	(2.09)	(.40)	(–.38)	(2.84)
R-squared	22.2%	5.0%	52.3%	37.0%

* $p \leq .05$

[a] Married is the reference group.

FIGURE 2. Stressful Life Events for Four Marital Groups



for each of the marital disruption groups are small and the results must be viewed as tentative, collectively they imply that divorce does indeed ratchet up the level of stressful midlife events both immediately and years after divorce. Further, recoupling after divorce does not guarantee an immediate return to a less stressful existence.

The Mediating Effects of Stressful Midlife Events

The last two columns of Table 4 summarize the results of fitting the complete set of predictor variables to the two outcomes. In the parameters of these two equations, chronic illness and chronic distress (1991–1994) are set as exogenous variables so that the only mediating variables in the model are the level and slope of stressful midlife events. All indirect effects of change in marital status (as well as the indirect effects of chronic dimensions of illness and distress) on illness and depressive symptoms in 2001 are mediated through stressful midlife events. In Table 4, as in Table 3, depressive symptoms and illness in 2001 are predicted by chronic depressive symptoms (.609; $t = 8.83$) and chronic illness (0.841; $t = 13.71$) respectively. These high stabilities reinforce our assertion about the chronicity of illness and distress: Most women who entered their middle years with poor health and high distress continued to be in poor physical and emotional health throughout the decade.

For depressive symptoms (2001), both the level (.109; $t = 2.18$) and slope (.582; $t = 3.14$) of stressful midlife events had significant effects. This implies that changes in depressive symptoms between 1994 and 2001 are shaped by the level of—and especially by the change in the level of—stressful midlife events recorded in early 2001 for the years 1994–2000. The relative strength of the coefficient associated with the slope compared to the intercept suggests either that recent events are more salient in stimulating changes in depressive symptoms or that particularly stressful events are telegraphed forward and recalled as more recent events.

In contrast, change in physical illness between 1994 and 2001 is affected to a relatively greater degree by the persistent level of stressful midlife events (.423; $t = 2.29$) rather than by the slope (1.268; $t = 1.82$). This relative sensitivity of illness to the level rather than the slope of stressful midlife events, although not dramatic, is consistent with the hypothesis that physical health is shaped more by chronicity of stress than by acuteness of stress. Women with consistently high levels of stress between 1994 and 2001 recorded significantly higher increases in illnesses than those with low levels of stressful events.

The effects of "divorce" (1989–1990) on change in physical illness and depressive symptoms in Table 4 are distinct from the results reported in Table 3. Table 3 reports the total effects of change in marital status, whereas Table 4 reports the direct effects. For physical illness in 2001, the decomposition of the total effect is relatively straightforward: The significant total effect of "divorced" (1989–1990) on change in physical illness observed in Table 3 (.118) decomposes into a direct effect (.083; $t = 1.82$) and an indirect

effect (.037; t = 2.32; not shown in tabular form), implying that a proportion (31%) of the total effect of divorce on change in illness over the decade is mediated through a combination of level of and change in the level of stressful midlife events recorded between 1994 and 2000.

The effect of "divorced" (1989–1990) on change in depressive symptoms is more complicated. Table 3 reports a negative but nonsignificant total effect of "divorced" (1989–1990) on change in depressive symptoms (–.014; t = –1.19), whereas Table 4 reports a significant negative direct effect (–.29; t = –2.39). Although it is possible to overinterpret these differences, especially because "recoupling" occurs at different times throughout the interval from 1991 to 2000, they do allow for the possibility that two countervailing forces link divorce to depressive symptoms. As observed in the second column of Table 4, "divorced" (1989–1990) has a significant and positive relationship to the slope of stressful midlife events (.017; t = 2.18). In the third column of Table 4, the slope of stressful midlife events is significantly related to change in depressive symptoms over the decade. The two paths combine to form a significant indirect effect (.014; t = 2.62; not shown in tabular form) of "divorced" (1989–1990) on change in depressive symptoms through the increase in stressful events that accompanies being divorced. However, the negative direct path from "divorced" (1989–1990) to depressive symptoms in 2001 may suggest that there remains a lasting sense of relief as reflected in larger decreases in depressive symptoms for the divorced when compared with the married. This is a phenomenon that has been observed before (e.g., Thoits 1995; Turner and Avison 1992), but not over the course of a decade.

DISCUSSION

The results above are consistent with our hypotheses and offer insights into how the crisis and chronic stress models of adjustment to divorce proposed by Amato (2000) might complement rather than compete with one another. The first two hypotheses were derived by linking the crisis and chronic dimensions of adjustment after divorce to Wheaton's (1996) image of acute and chronic stressors, respectively, and then proposing that volatile outcomes such as psychological distress are more reactive to acute stressors than are physical illnesses, which accumulate incrementally in response to the relatively stable dimensions of chronic stress. The observed increases followed by declines in depressive symptoms in the years immediately after divorce suggest that psychological distress is indeed more volatile than physical illness, and the crisis model may best apply to more volatile outcomes. In contrast, if *being divorced* is a chronic stressor because of the longer-term economic hardship and social isolation it causes, then the observed changes in illness over the decade can be understood to be a cumulative response to chronic conditions.

Documentation of the timing of stressful events facilitated valuable insights in at least three ways. First, previous researchers have repeatedly argued that disadvantaged members of society are exposed to more stressful events, which, in turn, proliferate, thus producing a "chain of adversity" (Turner and Lloyd 1999; Pearlin et al. 2005). By fitting a growth curve to the event history data, we separated levels of stressful life events from change over time and demonstrated that acute events, when aggregated within a year and compared across years, display a degree of chronicity. The results demonstrate that divorced mothers of adolescent children have chronically higher levels of acute stressful events independent of chronic stressors such as greater parenting burdens or worse jobs and work conditions. Further, the rate of increase in stressful events between 1994 and 2000 was higher among the divorced than among the married, providing evidence that stress proliferation is demonstrably more severe among these disadvantaged mothers.

Second, the distinction between absolute levels and rates of change in stressful life events added strength to the tests of the first two hypotheses. Although the differences are not dramatic, our data showed that change in illness between 1994 and 2001 was predicted relatively more strongly by chronic levels of stressful events, whereas changes in depressive symptoms during that same time were predicted more strongly by changes in stressful events. These findings suggest that more proximal events had a relatively greater impact on the distress recorded in 2001, while the effects of more distal events seemed to fade.

Third, the events recorded between 1994 and

2000, when coupled with patterns of change between 1991 and 1994, allow us to continue to tell a story begun by Menaghan and Lieberman (1986) and to amend the optimistic short-term scenario proposed by Lorenz et al. (1997). It may be that stressful events decline immediately after divorce, as the acute model of divorce adjustment predicts, but they appear to accumulate again over the longer term. When the two patterns are put together, the result suggests a U-shaped curve linking the level of stressful midlife events to time since divorce. The trough of the U reflects the declining impact of getting divorced, while the rightmost upward portion reflects the proliferation of stressors that follow from being divorced.

The study's design yielded measures of distress and health that predate information on stressful life events. Using these measures, we found that earlier levels of both depressive symptoms and physical illness between 1991 and 1994 predicted the level of stressful life events between 1994 and 2000, but not the rate of change in the levels of those events. This provides evidence to support Lin and Ensel's (1989) event proneness hypothesis and shows that physical and emotional health conditions are both a cause and a consequence of stressful events. To the extent that the event proneness hypothesis is a special case of the selection hypothesis, which Amato (2000) identifies as the leading competitor with his divorce-stress-adjustment model, it reminds us that important determinants of adult physical and emotional health, as well as of marital stability, are located in early childhood conditions. While these conditions may have genetic origins, evidence is accumulating that childhood and adolescent traumas and adversities are powerful predictors of adult adjustment and health (Chapman et al. 2004; Felitti et al. 1998; O'Rand and Hamil-Luker 2005; Turner and Lloyd 1995; Whitfield et al. 2005). Stated in extreme terms, our finding that divorce affects psychological distress and physical health both directly and through stressful events that follow from it may be spurious. Although this seems unlikely, Lorenz et al. (1997) did show that women's self-reports of earlier deviant behavior, which included adolescent delinquency, rivaled divorce as a predictor of stressful events and depressive symptoms. This makes future research that prospectively links childhood experiences to adult physical and mental health especially important, and our continued work with the children of this panel, who have grown from adolescents into adults under our watch, provides an opportunity to more comprehensively examine steps in a sequence whereby stressful events undermine health, and poor health leads to a proliferation of stressors.

Two final methodological issues remain, one dealing with measurement and the other with the sample. First, the two outcome variables reflect opposite ends of the health continuum, from nonspecific depressive symptoms to counts of specific physical illnesses. Although the outcome variables were selected to demonstrate that models of adjustment to divorce may be different depending on the outcome selected, the two alone do not capture the full spectrum of life-course disruptions to mental and physical health that divorce can cause. As Aneshensel (2005) has argued, future research should adopt a social consequences model of life-course disruptions by taking into account a more comprehensive array of symptoms (e.g., anxiety, hostility, anger), behavioral problems (e.g., violence, antisocial behavior, alcohol and substance abuse), and mental disorders (e.g., diagnoses of depression, anxiety disorder), as well as other physical health outcomes such as physical limitations, pain, and self-assessed overall health.

Second, our sample includes only a narrow swath of all possible family arrangements and may not reflect the experiences of all women, much less all adults (Barrett and Turner 2005). Still, our sample does capture those women most responsible for parenting children through their adolescent years. When policy makers express concern about divorce, they cite its disruptive effects on families where children are present, and our sample focuses on the health outcomes of mothers in these families. The physical and emotional health of these mothers is important as the first step in a sequence: As their health is impeded, their ability to monitor and support their children is undermined. Beyond that, however, it is reasonable to ask how representative a panel of rural Iowa families is when generalizing these results to married and divorced mothers in other settings. Our answer is indirect but reassuring. The decision to sample from a cluster of counties in north-central Iowa was based on practical constraints described elsewhere (Conger and Elder 1994). Despite these con-

straints, evidence is accumulating that relationships found in this panel reflect not only rural families but also families with children in other contexts, including African American (Conger et al. 2002) and Mexican American (Parke et al. 2004) families, urban families in Oregon (Conger, Patterson, and Ge 1995), and families in Finland (Solantaus, Leinonen, and Punamaki 2004) and the Czech Republic (Lorenz, Hraba, and Pechacova 2001). That said, it is still true that only a few longitudinal studies have examined a wider spectrum of men and women (e.g., Johnson and Wu 2002), and most have not examined a comprehensive set of outcomes, as advocated by Aneshensel (2005). Comprehensive panel studies that examine multiple health outcomes over time are still few in number, and more are needed if the health consequences of divorce are to be more completely understood.

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