Early Parental Loss, Recent Life Events, and Changes in Health Among Older Adults

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The purpose of this study is to see whether older adults who lost a parent early in life are more vulnerable to the effects of recent stressful events than elderly people who were raised in an intact home. Data from a nationwide longitudinal survey of older adults provide support for this view. The findings indicate that the combined effects of early parental loss and recent stressful events are associated with a decline over time in global self-rated health, as well as the number of chronic and acute conditions. In contrast, significant effects failed to emerge with functional disability. This study contributes to the literature by suggesting that only certain kinds of recent events (i.e., stressors arising in highly valued roles) act in concert with early parental loss to compromise health in late life.

Most studies on stress in late life focus exclusively on events that arise 6 months to a year before the data are collected (e.g., Krause, 1986). However, this brief time frame overlooks the fact that elders have literally been exposed to adverse situations for decades. By ignoring prior stressful experiences, researchers may be stripping away the rich biographical context that is needed to more fully understand the impact of current life events on health (Pennell, 1996).

One way to address this problem is to adapt a life course perspective (George, 1996). When used to study the effects of stress, this

approach involves the simultaneous analysis of stressors arising earlier in life and events that have emerged during the adult years (Wheaton, 1994). However, even a moment's reflection reveals that it would be virtually impossible to inventory every stressor encountered during an entire lifetime. Instead, a more feasible strategy must be found. The approach followed in the present study begins with the assumption that focusing on stressors that arise during key developmental phases in the life course provides an expedient way of tackling this problem. Many argue that childhood is among the most important developmental periods (e.g., Bowlby, 1980; Erikson, 1959). According to this view, major stressors arising at this point may have a profound impact on reactions to subsequent life events in the adult years. Of all the childhood stressors that have been investigated, perhaps none has received more attention than early parental loss (see Finkelstein, 1988, and Tennent, 1988, for reviews of this research). Although there is considerable debate over the precise mechanisms that are involved, this research generally indicates that people who lose a parent at an early age tend to have a less satisfactory adjustment to stressors as adults and that, as a result, they are especially likely to develop physical or mental health problems (Champion, Goodall, & Rutter, 1995; Landerman, George, & Blazer, 1991; O'Neil, Lancee, & Freeman, 1987).

The purpose of the present study is to examine the interrelationships among early parental loss, recent life events, and changes in physical health status during late life. There are at least three reasons why this type of research is needed. First, the wide majority of investigators study young or middle-aged people (e.g., Brown & Harris, 1978), whereas far less effort has been devoted to evaluating whether the effects of early parental loss spill over into the later decades of life as well (see Krause, 1993, for a notable exception). Second, most researchers are concerned solely with mental health outcomes (especially depression), whereas relatively less is known about the potential impact of early parental loss on the physical health status of older adults (but see Friedman et al., 1995). Finally, many studies rely on small samples drawn from clinical populations. Larger and more representative samples are needed to ensure that study findings may be generalized to a wider pool of elderly people. In the process of

addressing these limitations, an effort is also made in the present study to contribute to the literature by infusing research on early parental loss with recent advances in the measurement of stressful life events.

The discussion that follows is divided into three main sections. The theoretical underpinnings of the study are developed in the first section. Following this, the sample and measures are presented. The data analytic strategy is also briefly introduced at this point as well. Finally, results provided by a longitudinal nationwide survey of older adults are reviewed and discussed.

Theoretical Rationale

The overall thrust of the discussion in this section is twofold. First, an effort is made to show why early parental loss may be a landmark stressor. Next, a theoretical rationale is developed to suggest why the early loss of a parent interacts with some (but not all) kinds of recent life events to create physical health problems among elderly people.

DELETERIOUS EFFECTS OF EARLY PARENTAL LOSS

Viewed at the most general level, research indicates that early parental loss compromises the ability of individuals to function effectively as adults. Although a range of resources are needed for effective functioning across the life course, three figure prominently in the literature on early parental loss. Compelling research by Brown and his colleagues suggests that early feedback and intimate interaction with parents plays an essential role in shaping a child's sense of self-worth and personal control (Brown & Harris, 1978). Moreover, these investigators argue that once these resources are compromised, deficits in feelings of self-worth and personal control remain permanently lowered across the remainder of the life course. Extensive work by Bowlby (1980) shows how early parental loss affects interpersonal relationships as well. In particular, his research reveals that the nature of the relationship with one's parents serves as a prototype for subsequent social ties during the adult years. If a child is separated from his or her parents through death or divorce, social relationships during the ensuing decades may become transient, shallow, and ineffective.

Deficits in these particular resources are noteworthy because research suggests that each is essential for coping effectively with stress in adult life. For example, extensive research reveals that elders with diminished feelings of self-worth and personal control do not deal with recent events as well as older adults who have more positive self-evaluations (Krause, 1987). Similarly, a vast literature suggests that one of the major functions of social support is to offset the deleterious effects of stressful events that are encountered in late life (Krause, 1997). Stated simply, the literature reviewed here suggests that early parental loss may affect the health of older adults because it erodes the social and psychological resources needed to cope successively with contemporaneous stressful events.

One goal of the work provided below is to take a preliminary step toward evaluating the theoretical perspective that has been developed so far. Care must be taken, however, to make sure that these tests capture the essence of this conceptual framework. Following the work of Brown and Harris (1978), early parental loss is viewed as an ongoing vulnerability factor that is a necessary, but not sufficient, cause of health problems in late life. More specifically, their work indicates that the underlying vulnerability created by the loss of a parent early in life leads to pathological outcomes only when it operates in conjunction with contemporaneous life events. Stated more technically, this specification calls for a statistical interaction between early parental loss and recent stressful events on health. Several studies provide empirical support for this hypothesized interaction effect (e.g., Brown & Harris, 1978; Landerman et al., 1991; O'Neil et al., 1987) but, as noted earlier, this work has been concerned solely with depression among younger adults.

In addition to linking research on early parental loss with physical health, an effort is made in the research that follows to contribute to the literature by assessing whether some (but not all) life events may interact with early parental loss to challenge the physical health of older adults. In their groundbreaking work on the effects of early parental loss, Brown and Harris (1978) argue that only severe events involving a loss, or the threat of a loss, act in tandem with early parental loss to create mental health problems in adulthood. However, these investigators do not provide a fully articulated explanation for why this may be

the case. The goal of the discussion in the next section is to address this limitation by showing how recent advances in identity theory may be used to ferret out a subset of recent stressors that may be especially likely to act in concert with early parental loss to compromise the physical well-being of elderly people.

EARLY PARENTAL LOSS AND STRESSORS IN LATE LIFE

The gist of the theoretical rationale provided in this section is that stressors arising in roles that are valued highly are especially likely to operate in conjunction with early parental loss to adversely affect the health of older adults. To see why this may be so, it is important to briefly review recent extensions of identity theory by Thoits (1991) and Burke (1991).

Social roles and identities assume a pivotal position in this conceptual framework. According to this perspective, social roles are defined structurally as a position in a group (e.g., husband, father, provider), whereas identities are self-evaluations that emerge from occupying specific roles (e.g., "I am a father"). Associated with each role are clusters of normative expectations that provide a basis for evaluating the adequacy of role performance. According to Thoits (1991), stressors arising in certain roles are likely to be especially noxious because they have the capacity to undermine the identity associated with the role. However, this perspective further stipulates that only some events are capable of doing so.

People typically occupy a number of different roles. Consequently, there is a separate role identity associated with each of these social positions. However, individuals attach greater importance to some role-specific identities than others. More specifically, as Stryker (1987) points out, individual role identities are organized into a salience hierarchy reflecting various levels of commitment to, and emotional investment in, the roles underlying these identities.

The crux of the argument developed by Thoits (1991) and Burke (1991) rests on the assumption that if some roles are more important than others, and if individuals are differentially committed to these roles, then the impact of stressors arising in various social roles will depend on where these roles are located in the salience hierarchy:

Events arising in roles that are valued highly will exert a more deleteri-
ous effect than stressors that emerge in roles that are less important.
Empirical evidence for the perspective devised by Thoits (1991) and
Burke (1991) has been provided by a series of studies with older adults
(Krause, 1994, 1995; Krause & Borawski-Clark, 1994). Viewed from
the perspective developed by Brown and Harris (1978), the rationale
presented here suggests that stressors emerging in highly valued roles
are likely to be especially severe because they involve the loss of an
important psychological entity—one's sense of identity.

Taken as a whole, the theoretical rationale developed for this study
leads to the following hypothesis: Stressors arising in salient social
roles are more likely to create physical health problems for older
adults who lost a parent early in life than for elders raised in an intact
home.

Methods

SAMPLE

When the baseline data for this longitudinal study were gathered,
the study population was defined as all household residents who were
noninstitutionalized, English-speaking, 65 years of age or older, and
retired (i.e., not working for pay). Geographically, this study popula-
tion was restricted to all eligible persons residing in the contiguous
United States (i.e., residents of Alaska and Hawaii were excluded).

The sampling frame consisted of all eligible individuals contained
in the Health Care Finance Administration (HCFA) Medicare Benefi-
ciary Eligibility List. This list contains information on the name,
address, sex, and race of virtually every older adult in the United
States. It should be emphasized that elderly people are included in this
list even if they are not currently receiving Social Security benefits.
Even so, two groups of older adults are not covered by this database:
Elders who do not have a Social Security number (this may be due to
factors such as illegal immigration) and older adults who are 100 years
of age or older (HCFA does not release the names of these individuals).

A three-stage process was used to draw the sample for this study. First, 5% of the names in the master file maintained by HCFA were selected with a simple random sampling procedure. Next, 110 counties across the coterminous United States were identified as primary sampling units (PSUs). These PSUs were selected with probability proportionate to the number of persons who were retired and at least 65 years of age. Following this, 10 eligible persons were selected at random from each PSU. Some counties (e.g., Dade County, Florida) were oversampled because they contain a disproportionately large number of eligible older adults.

Interviewing for the baseline survey began in October 1992 and concluded in February 1993. Louis Harris and Associates performed the data collection. A total of 1,103 interviews were completed successfully. The response rate for the baseline interviews was 69.1%.

During October 1996 through February 1997, an effort was made to reinterview all older adults who participated in the baseline survey. Louis Harris and Associates also conducted the follow-up interviews. The disposition of the sample at Wave 2 is as follows: Reinterviewed successfully ($n = 605$), dead ($n = 173$), moved to a nursing home ($n = 33$), refused ($n = 75$), could not be located ($n = 98$), and too ill to participate ($n = 119$). Excluding those who were either dead or residing in a nursing home, 67.5% of the baseline study participants were successfully reinterviewed at the follow-up.

After using listwise deletion of missing values to deal with item nonresponse, data were available for between 531 and 593 study participants. Preliminary analysis of the 593 elders who provided complete data reveals that the average age of these individuals was 73.8 years at the baseline survey ($SD = 6.3$ years). Approximately 38% are men. These respondents reported during the Wave 1 interviews that they had successfully completed an average of 11.1 years of schooling ($SD = 3.4$ years). About 91% of the study participants are White. Finally, approximately 50% of those providing valid data indicated that they were married at the time of the Wave 2 survey. These descriptive statistics, as well as the findings presented below, are based on weighted data.

MEASURES

Table 1 contains the variables that are analyzed in this study. In addition, the procedures used to code these measures are contained in the footnotes of this table.

Physical health status. Based on the work of Liang (1986), physical health status is assessed with three measures: global self-rated health, functional disability, and the number of chronic and acute health problems. It should be emphasized that identical measures of each construct were included in the baseline and follow-up interviews. Consequently, the analyses presented below focus on *changes* in health status over time.

As shown in Table 1, global self-rated health was assessed with a single item that asks study participants to rate their overall health as either excellent, good, fair, or poor. This is a well-known and widely used approach in survey research for assessing physical health (Idler & Benyamini, 1997). This measure was reverse coded so that a high score denotes poor health. The mean of this indicator at the baseline survey was 2.181 (*SD* = .832), whereas the mean at the follow-up interview was 2.310 (*SD* = .850).

Functional disability is assessed with 14 items taken from the work of Liang (1990). Indicators of instrumental activities of daily living (IADL), as well as activities of daily living (ADL), are included in this index. These indicators reflect the amount of difficulty an elder encountered in performing each task. A high score denotes greater difficulty with ADL and IADL functions. The mean functional disability score at the initial wave of interviews was 5.855 (*SD* = 9.198), whereas the mean at Wave 2 was 7.694 (*SD* = 10.593).

The final health status measure is a simple unweighted count of the number of acute and chronic health problems experienced by an older adult during the year preceding each interview. These measures were also taken from research by Liang (1990). A high score represents more physical health problems. The participants in this study indicated that they had an average of 2.293 health problems at the baseline survey (*SD* = 1.654) and an average of 2.499 conditions at the follow-up interview (*SD* = 1.672).

Table 1
Study Measures

1. Global self-rated health
    How would you rate your overall health at the present time?
    Would you say it is excellent, good, fair, or poor?[a]
2. Functional disability[b]
    Because of your health or physical health problems, how much difficulty do you have
    A. Shopping for personal items, such as toilet items or medicines?
    B. Using the telephone?
    C. Bathing yourself?
    D. Climbing 2-3 flights of stairs?
    E. Walking about one-quarter mile?
    F. Doing heavy work around the house, such as shoveling snow or washing walls?
    G. Taking a train or bus by yourself?
    H. Standing or being on your feet about 2 hours?
    I. Stooping, crouching, or kneeling?
    J. Reaching over your head?
    K. Using your fingers to grasp or handle?
    L. Lifting or carrying something as heavy as 25 pounds?
    M. Dressing or undressing yourself?
    N. Feeding yourself?
3. Acute and chronic health problems[c]
    Have you experienced any of the following health problems during the past 12 months?
    A. Arthritis or rheumatism?
    B. Cataracts, glaucoma, or other eye diseases?
    C. Asthma, emphysema, chronic bronchitis, tuberculosis, or other respiratory diseases?
    D. Hypertension, sometimes called high blood pressure, or have you taken medication
    for it?
    E. A heart attack or other heart trouble?
    F. Diabetes or high blood sugar, or have you taken medication for it?
    G. Ulcers of the digestive system or other stomach or intestinal disorders?
    H. Liver disease?
    I. Cancer or malignant tumor of any kind?
    J. Kidney disease?
    K. Other urinary tract disorders?
    L. (For men) prostate trouble?
    M. Any other major health problem?
4. Early parental loss
    A. Up to the age of 16, did you always live with both your natural parents?[a]
    B. (If no) Why didn't you live with both your natural parents up to the age of 16?[e]
5. Stressful life events
    A. Life events in highly salient roles—The unweighted sum of all undesirable events
    arising in the three roles that are valued most highly.
    B. Life events in roles that are valued less highly—The unweighted sum of undesirable
    events arising in roles that are less salient.

a. This item is coded in the following manner (scoring in parentheses): excellent (1), good (2), fair (3), poor
(4).
b. These items are coded in the following manner: unable to do (4), a lot of difficulty (3), some difficulty (2), a
little difficulty (1), no difficulty at all (0).
c. These items are coded in the following manner: yes, condition is present (1);
respondent does not have this health problem (0).
d. This item is coded in the following manner: yes (1), no (2).
e. The following response options were available for this item: parents divorced/separated, father died, mother
died, both parents died, adopted, parents never married, some other reason.

Early parental loss. Two questions were contained in the follow-up interview schedule to assess early parental loss. The first asks whether a respondent lived with both natural parents up to the age of 16. The second question is designed to determine the reason why a respondent may have lost a parent during this time. Although both items are designed to capture an event that occurred decades ago, research reviewed by Brewin, Andrews, and Gotlib (1993) suggests that the early loss of a parent is recalled with good reliability. For example, Cherlin and Horiuchi (1980) report a 4-year test-retest reliability estimate of .8 for adults who were queried about living with their parents at age 14.

It should be emphasized that because data on early parental loss was gathered at the follow-up only, the analyses presented below are not prospective in the strictest sense of the term. However, as research on the reliability of retrospective reports reveals, it is not likely that the measurement strategy used in the present study is flawed significantly.

A simple binary measure was created with the data obtained from the questions in Table 1. More specifically, a score of 1 represents those who lost a parent prior to age 16, whereas a score of 0 denotes those who were raised in intact homes. Preliminary data analyses reveal that 21.1% ($n = 125$) of the study participants lost a parent prior to age 16. This prevalence rate is similar to data provided in other nationwide surveys of elderly people (Krause, 1993).

There is considerable debate in the literature on how to operationalize early parental loss. Researchers have identified at least two dimensions that should be taken into consideration: The first is concerned with the reason for the loss, whereas the second has to do with the age of the respondent at the time of the loss. Research on whether a parent was lost through death or divorce/separation is inconsistent. Some investigators suggest that loss due to death may be the most important factor (e.g., see Finkelstein, 1988, for a review of this research), whereas another group believes that loss through divorce or separation may have a more devastating impact (Tennent, 1988). In contrast to these views, some studies find equally important effects for loss either through death or divorce (e.g., Brown & Harris, 1978). This complicated issue is not addressed in the present study because relatively few study participants reported that their parents were divorced or separated ($n = 23$). Even so, as the analyses presented below will reveal,

sizable effects of early parental loss emerge with the measurement strategy that is adapted in the present study.

There is also contradictory evidence concerning the importance of the age of the child at the time of the loss. Research reviewed by Crook and Eliot (1980) reveals that some investigators suggest that loss before age 16 is the most important, whereas other researchers maintain that children at age 11, or even age 5, may be the most vulnerable. Based on a comprehensive analysis of this issue by Krause (1993), no effort was made to determine the age at the time of the loss in this present study. Instead, loss prior to age 16 was used to operationalize this measure.

Stressful life events. The main hypothesis in this study specifies that elders who lost a parent early in life are especially vulnerable to the effects of recent events arising in roles that are valued highly. A two-step process was followed to construct the stress measures needed to test this proposition: The first involved finding out which roles are valued highly by study participants, whereas the second was concerned with identifying stressors arising in the roles occupied by respondents in this study.

Based on procedures devised by Hoelter (1985), study participants were presented with a list containing the following eight roles: spouse, parent, grandparent, other relative, friend, homemaker, provider, and voluntary work/church or club member. These roles were identified in interviews conducted as part of the pilot and pretest phases of this study. Initially, participants in the nationwide survey were asked to identify three roles that best capture how they tend to describe themselves. Once three roles were identified, they were asked to rank order them according to whether they were first, second, or third most important. A table containing the distribution of selected roles at the baseline survey is provided by Krause (1994).

Information on stressful life events was obtained with a 49-item checklist. Respondents were asked whether they experienced any of these stressors in the year preceding the interview. In addition, they were asked to classify the events they encountered as either desirable or undesirable. The stressful events contained in this checklist were clustered into conceptual domains that correspond to the eight roles listed above. This means, for example, that all stressors arising in the

parental role were contained in the same section. A similar procedure was followed for the seven remaining roles. As Stone, Kessler, and Haythornthwaite (1991) point out, this approach facilitates recall because it allows respondents to think about one life domain at a time instead of skipping back and forth across multiple domains, as is typically done in most life event surveys.

It is virtually impossible to develop a life event checklist that contains every stressor that can arise within a social role. Fortunately, it is possible to confront this problem with a procedure used by Krause (1986). In particular, stressors not contained in the checklist may be identified by placing an open-ended probe at the end of each list of role-related stressors. For example, the section dealing with stressors that involve a study participant's children concludes with an open-ended item that asks whether anything else happened to their children, in addition to the events already covered in the closed-ended checklist. Respondents were encouraged to report up to three additional life events in each social role. Because physical health status serves as the main outcome in this study, it is important to emphasize that none of the stressors included in the life event inventory dealt with the respondent's own illness or own hospitalization.

To test the main study hypothesis, the stress measure was partitioned into two variables reflecting stressors arising in salient social roles and life events that were encountered in roles that are not as highly valued by study participants. It is important to describe how this was accomplished. It may initially appear that a more precise test would involve focusing solely on the events arising in the one role valued most highly by respondents. However, a simple summary measure was created that represents stressors arising in all three salient roles combined. There are two reasons for taking this approach. First, it is unlikely that there is a substantial difference in the value placed on the roles that cluster at the top of the salience hierarchy (McCall & Simmons, 1966). For example, it is doubtful that most people would feel that being a spouse is substantially more important than being a parent. If this is true, then relying on a narrow definition of salient roles (i.e., focusing on stressors in the espousal role only) would lead to an underestimation of the impact of life events arising in highly

valued roles. The second reason for focusing on stressors in three most important roles combined has to do with the incidence of stressful events in the study sample. Consistent with previous research (e.g., Krause, 1986), the respondents in this study did not experience a large number of stressful events during the year preceding the baseline interview. In fact, the elderly people in this study indicated that they had experienced only 2.168 events across all eight social roles combined. Partitioning the stress measure into events arising in each of the three most salient roles would have resulted in life event measures with little variance.

Based on the rationale provided above, two stress measures were created for this study. As noted above, the first represents a simple count of the total number of undesirable stressful events arising in all three salient social roles combined ($\overline{X} = 1.043$; $SD = 1.299$). The second measure stands for the total number of undesirable stressors encountered in all remaining nonsalient roles combined ($\overline{X} = 1.125$; $SD = 1.453$).

Although identical stress measures were included in the baseline and follow-up surveys, the life event data used in the analyses presented below come from the follow-up interviews only. This decision is based on the following rationale. The Wave 2 life event questions deal with stressors arising in the year prior to the follow-up survey. Because the between-round interval in this study is 4 years, this means that the earliest a stressor could have emerged would be 3 years after the baseline data on health were gathered. This strategy provides a better opportunity to observe the influence of stress on changes in health over time, because the life events captured in the Wave 2 survey clearly arose after the baseline measure of health was obtained.

Demographic control measures. The relationships among early parental loss, recent stressors, and physical health status are estimated after the effects of age, sex, education, race, and marital status are controlled statistically. Age is scored continuously in years, whereas sex (1 = men; 0 = women), race (1= White; 0 = others), and marital status (1 = married at Wave 2; 0 = otherwise) are represented by binary measures. Finally, education is coded in a continuous format reflecting the

total number of years of schooling that were completed successfully by study participants.

DATA ANALYSIS STRATEGY

Two sets of analyses are performed in this study. The first involves testing the main study hypotheses, whereas the second has to do with evaluating the potential effects of subject attrition over time.

Testing the main study hypothesis. As noted earlier, the theoretical rationale for this study calls for a statistical interaction between salient role stressors and early parental loss on changes in physical health status. The following ordinary least squares (OLS) multiple regression equation is used to test for these effects:

$$PH_2 = a + b_1 PH_1 + b_2 SS + b_3 NSS + b_4 EPL + b_5(EPL \times SS) + b_6 (EPL \times NSS) + \Sigma c_i Z_i \quad (1)$$

In this equation, PH_2 and PH_1 stand for physical health status at the follow-up and baseline surveys, SS refers to salient role stressors, NSS represents life events arising in roles that are not valued highly, and EPL is early parental loss. The Z_i in Equation 1 represents the control variables (i.e., age, sex, race, education, and marital status), "a" is the intercept, and the b_i and c_i are regression coefficients. Following the recommendations of Aiken and West (1991), all independent variables are deviation scored (i.e., centered on their means) before Equation 1 is solved.

It is important to point out that one modification was made in Equation 1 when functional disability served as the outcome measure. In particular, the Wave 2 measure of acute and chronic health conditions was included as an independent variable. As research by Liang (1986) and others indicates, specific physical health problems are a major cause of functional limitations. Including measures of specific health problems in the analyses makes it possible to test two alternative views of how early parental loss and recent events might affect physical functioning. First, these stressors may influence functional limitations indirectly by creating specific acute and chronic conditions. In

contrast, early parental loss and recent life events may exert a direct effect on physical functioning, independent of particular health problems.

Equation 1 is estimated in a stepwise fashion. The additive effects of the independent variables are estimated in the first step (i.e., PH_1, SS, NSS, EPL, and the Z_i). Following this, the multiplicative terms assessing the interaction between early parental loss and the stress measures are entered at Step 2 (i.e., EPL X SS; and EPL X NSS). An additional formula provided by Aiken and West (1991) is then used to derive two estimates: The first reflects the impact of contemporaneous stress on the health of elders who lost a parent early in life, whereas the second captures the influence of recent stressors on the health of older adults who were raised in an intact home. Significance tests are subsequently computed for these estimates.

Assessing the effects of sample attrition. When the study sample was described earlier, data were presented which reveal that some participants in the Wave 1 survey were not reinterviewed at Wave 2. The loss of study subjects may bias the findings if it occurs nonrandomly. Although it is difficult to determine the extent of the problem precisely, some preliminary insight may be obtained by seeing whether select data gathered at the baseline survey are related significantly to subject participation status at Wave 2 (see Norris, 1985, for a discussion of this approach). The following procedures were used to implement this strategy. First, a binary outcome measure was computed by assigning a score of 1 to all subjects who were successfully reinterviewed at Wave 2 and a score of 0 to those who were lost to follow-up. Then, using logistic regression, this binary measure was regressed on the following baseline indicators: age, sex, marital status, race, education, global self-rated health, functional disability, the number of acute and chronic health problems, stressors arising in salient roles, and life events emerging in roles that are not valued highly. If any of these independent variables are related significantly to the binary outcome, then there would be some evidence that sample attrition has occurred in a nonrandom manner.

Results

The findings from this study are presented in two sections. The potential effects of subject attrition are examined first. Following this, data on the relationships among early parental loss, recent life events, and changes in health are reviewed.

THE EFFECTS OF SAMPLE ATTRITION

Findings from the logistic regression analyses that were designed to assess the relationship between select baseline measures and study participation status at the follow-up indicate that the loss of subjects through time did not occur in a random manner. More specifically, these data (not shown here) suggest that, compared with elders who were reinterviewed successfully, older adults who did not participate in the Wave 2 survey were more likely to be male and less likely to be White. Moreover, the analyses indicate that those who were lost to follow-up had worse self-rated health, more problems with physical functioning, and more chronic and acute conditions than elders who were reinterviewed successfully (a table containing the results of these analyses is available from the author on request). This pattern of findings is consistent with other studies of nonresponse in longitudinal surveys (Groves, 1989). Although it is difficult to determine the precise effects of nonrandom attrition on the study outcomes, the potential biasing effects of this problem should be kept in mind as the main study findings are reviewed.

EARLY PARENTAL LOSS, RECENT EVENTS, AND HEALTH

Tables 2 through 4 contain the results of the tests for the hypothesized interaction effect between early parental loss and recent stressors on each of the three health outcomes. The first column in each table provides estimates that were obtained when only additive terms were included in the equation, whereas the coefficients in the second column were derived after the multiplicative terms were entered into the model.

The data in the left-hand column of each table indicate that early parental loss fails to exert a significant additive effect on any of the

health outcome measures. More specifically, the loss of a parent prior to age 16 appears to be unrelated to changes in either global self-rated health (β = −.021; not significant), the number of chronic and acute health problems (β = .004; not significant), or functional disability (β = −.037; not significant).

Similarly, stressors arising in highly valued roles do not initially appear to exert a consistent effect on the three health outcomes. More specifically, the data in the left-hand columns of Tables 2-4 indicate that elders who encounter stressors in roles they value highly are not more likely to experience a decline in self-rated health (β = .062; not significant) or encounter greater difficulty with ADL and IADL tasks over time (β = .015; not significant). However, stressors in highly salient roles do appear to be associated with an increase in the number of chronic and acute health problems (β = .175; p < .001).

Finally, an examination of the additive effects of life events arising in roles that are not valued highly reveals that, like the other stress measures, this type of life event does not play a substantial role in shaping the physical health status of elderly people. Although the effects of nonsalient role stressors on global self-rated health is statistically significant, the size of the effect is modest (β = .086; p < .05). Moreover, life events arising in roles that are not valued highly fail to exert a significant effect on changes in the number of acute and chronic conditions (β = .058; not significant) or functional disability (β = .039; not significant).

Taken together, the findings involving the additive effects of the stress measures are fairly consistent: Viewed individually, stressors arising early in life (i.e., early parental loss), as well as events encountered during the later years (i.e., salient and nonsalient role stressors), are not consistently related to changes in physical health over time. However, a different conclusion arises when the joint or combined effects of early and late life stressors are examined below.

Two important findings emerge from the data presented in column 2 of Table 2. First, the results indicate that there is a statistically significant interaction effect between stressors arising in highly valued roles, and early parental loss on changes in global self-rated health over time (b = .211; p < .001; unstandardized effects are discussed when reviewing statistical interactions because standardized coefficients are meaningless in this context). However, the nature of this

Table 2
Early Parental Loss, Recent Life Events, and Changes in Global Self-Rated Health (N = 592)

Independent Variables	Additive Effects	Interaction Effects
Global self-rated health (T1)	.527***[a]	.526***
	(.537)[b]	(.536)
	.036[c]	.036
Age	−.007	−.008
	(−.001)	(−.001)
	.005	.005
Sex	.039	.038
	(.068)	(.067)
	.063	.063
Education	−.048	−.053
	(−.012)	(−.013)
	.009	.009
Marital status (T2)	−.056	−.061
	(−.094)	(−.103)
	.065	.065
Percent White	−.062	−.058
	(−.184)	(−.173)
	.108	.108
Salient role stress	.062	.075*
	(.040)	(.049)
	.024	.024
Stress in nonsalient roles	.086*	.086*
	(.050)	(.050)
	.021	.021
Early parental loss	−.021	−.022
	(−.043)	(−.046)
	.071	.070
(Salient role stress × early parental loss)	—	.123***
	—	(.211)
	—	.061
(Stress in nonsalient roles × early parental loss)	—	−.039
	—	(−.055)
	—	.050
Multiple R^2	.339	.352

a. Standardized regression coefficient.
b. Metric (unstandardized) regression coefficient.
c. Standard error.
*p < .05. **p < .01. ***p < .001.

relationship may not be readily apparent from these data alone. Fortunately, as discussed earlier, it is possible to perform additional calculations by hand to clarify the findings. These additional computations

Table 3
Early Parental Loss, Recent Life Events, and Changes in Acute and Chronic Conditions
(N = 593)

Independent Variables	Additive Effects	Interaction Effects
Acute and chronic conditions (T1)	.496***[a]	.490***
	(.501)[b]	(.496)
	.036[c]	.035
Age	−.023	−.025
	(−.006)	(−.007)
	.010	.009
Sex	.043	.042
	(.148)	(.143)
	.127	.126
Education	−.047	−.054
	(−.023)	(−.026)
	.018	.018
Marital status (T2)	−.002	−.010
	(−.007)	(−.033)
	.131	.129
Percent White	−.011	−.008
	(−.007)	(−.003)
	.215	.214
Salient role stress	.175***	.193***
	(.226)	(.249)
	.048	.047
Stress in nonsalient roles	.058	.058
	(.067)	(.067)
	.043	.043
Early parental loss	.004	.002
	(.018)	(.008)
	.141	.139
(Salient role stress × early parental loss)	—	.159***
	—	(.539)
	—	.123
(Stress in nonsalient roles × early parental loss)	—	−.036
	—	(−.100)
	—	.100
Multiple R^2	.318	.340

a. Standardized regression coefficient.
b. Metric (unstandardized) regression coefficient.
c. Standard error.
*p < .05. **p < .01. ***p < .001.

(not shown in Table 2) reveal that stressors in highly salient roles exert
a fairly substantial effect on self-rated health when a parent was lost

early in life ($\beta = .332; p < .001$) but not when an elder resided with both parents before age 16 ($\beta = .008$; not significant).

The results reviewed up to this point are intriguing because they suggest that the impact of recent life events on health are contingent on stressors that emerged decades earlier. However, additional findings in the second column of Table 2 indicate that this may only be true for recent events that arise in highly valued roles. More specifically, the data in the right-hand column of Table 2 suggest that the interaction between stressors in roles that are not valued highly and early parental loss on global self-rated health is not significant ($b = -.055$; not significant). Taken together, the results in Table 2 are consistent with the main study hypothesis.

Further support for the theoretical framework developed in this study is provided in Table 3, where the number of acute and chronic conditions serves as the health outcome. More specifically, as shown in column 2, the joint effects of early parental loss and salient role stressors on changes in number of acute and chronic health problems over time is statistically significant ($b = .539; p < .001$). Further computations reveal that the effects of salient role stressors on acute and chronic health problems are especially pronounced when elders lost a parent prior to age 16 ($\beta = .523; p < .001$). However, the impact of salient role stressors is reduced substantially for older adults who were raised by both parents ($\beta = .105; p < .01$). Finally, as with global self-rated health, the data in Table 3 indicate that the interaction between early parental loss and stressors in roles that are not important is not significant at the .05 level ($b = -.100$; not significant).

In contrast to the results presented up to this point, the analyses involving functional disability do not appear to support the main study hypothesis (see Table 4). More specifically, the data in the right-hand column of Table 4 reveal that a significant statistical interaction between early parental loss and recent stressors in highly valued roles is not present in the data ($b = .826$; not significant). The same is true with respect to the interaction between early parental loss and events emerging in roles that are not valued highly ($b = .459$; not significant).

The initial impression created by the data in Table 4 is that early parental loss and salient role stressors do not influence the physical functioning of older adults. However, a careful examination of the findings suggests that a different interpretation may be in order.

Table 4
Early Parental Loss, Recent Life Events, and Changes in Functional Disability (N = 531)

Independent Variables	Additive Effects	Interaction Effects
Functional disability (T1)	.598***[a]	.593***
	(.689)[b]	(.683)
	.037[c]	.037
Age	.130***	.130***
	(.217)	(.216)
	.050	.050
Sex	−.063*	−.069*
	(−1.376)	(−1.494)
	.660	.665
Education	−.120***	−.121***
	(−.364)	(−.368)
	.094	.094
Marital status (T2)	−.030	−.034
	(−.641)	(−.719)
	.673	.673
Percent White	.000	−.003
	(.002)	(−.108)
	1.177	1.182
Acute and chronic conditions (T2)	.163***	.159***
	(1.020)	(.991)
	.198	.201
Salient role stress	.015	.020
	(.121)	(.165)
	.254	.255
Stress in nonsalient roles	.039	.038
	(.294)	(.282)
	.228	.228
Early parental loss	−.037	−.041
	(−.953)	(−1.061)
	.729	.731
(Salient role stress × early parental loss	—	.039
	—	(.826)
	—	.638
(Stress in nonsalient roles × early parental loss)	—	.026
	—	(.459)
	—	.530
Multiple R^2	.590	.593

a. Standardized regression coefficient.
b. Metric (unstandardized) regression coefficient.
c. Standard error.
*$p < .05$. **$p < .01$. ***$p < .001$.

Consistent with previous research (e.g., Liang, 1986), the data in Table 4 indicate that older adults with more acute and chronic health problems tend to report more functional limitations than elderly people with fewer specific health conditions ($\beta = .159; p < .001$). Because there is a significant interaction effect between early parental loss and salient role stressors on acute and chronic health problems (see Table 3), a more precise conclusion would be that these stressors influence physical functioning indirectly through acute and chronic health problems.

Conclusions

In a thought-provoking appeal to social and behavioral gerontologists, George (1996) argues that failure to consider the effects of early life experiences on the current circumstances of elderly people is the "single greatest weakness of social-psychological research" (p. 253). The findings from the present study serve to reinforce this view. In particular, the data suggest that researchers cannot fully understand the impact of recent life events on health, without also taking into consideration stressors that were encountered decades earlier. The fact that the early loss of a parent through death or divorce can influence physical health status over half a century later provides dramatic support for this view. Greater faith can be placed in the findings from this study because the effects were observed across different health outcomes with data that had been gathered at more than one point in time.

In addition to making a potentially useful empirical contribution to the literature, this study also aims to enhance conceptual or theoretical work on stressful events as well. More specifically, the results indicate that only some types of recent stressors may act in concert with the early loss of a parent to create physical health problems in later life. Based on recent extensions of identity theory, the results indicate that only life events arising in roles that are valued highly may be capable of triggering the underlying vulnerability created by the early loss of a parent.

Clearly, the findings from this study provide only a preliminary first step toward integrating the life course perspective into research on stressful events. Although childhood is undoubtedly important, it is

not the only point in the life course where traumatic events may arise. Instead, as Rutter (1996) points out, other major "turning points" may occur later in life as well. This suggests that an important task for the future is to devise a feasible strategy for measuring pivotal stressors that arise after childhood. Once this task is accomplished, researchers will then be able to evaluate whether these key events also operate in conjunction with recent stressors to promote physical and mental health problems in late life.

In the process of addressing this issue, researchers interested in pursuing life course issues would be well advised to attend to the limitations in the present study. Three are reviewed briefly below. First, the intervening constructs that link early parental loss and stressors in late life with health must be evaluated empirically. Second, other types of contemporaneous stressors should be taken into consideration—especially chronic strain. Third, random measurement error may create special problems in the estimation of statistical interaction effects.

The findings presented above suggest that early parental loss and recent life events may be related to changes in health over time, but the intervening constructs linking these stressors with health were not evaluated empirically. The theoretical rationale developed in this study suggests that elders who lost a parent early in life are more vulnerable to the effects of contemporaneous stressors because they have diminished feelings of self-worth and personal control, as well as difficulty forming close ties with others during the adult years. However, none of these coping resources were assessed in the analyses presented earlier. Although other investigators have shown that depleted coping resources compromise the ability of individuals to deal effectively with current stressors (e.g., Brown & Harris, 1978), no one has fully evaluated all of the linkages between early parental loss, salient roles stress, depleted coping resources, and changes in physical health over time in the same study. Doing so should be a high priority in future work.

The analyses presented in this study focus solely on one type of stressful experience—events arising in highly salient social roles. However, this obviously does not exhaust the range of stressors that confront older adults. Researchers might benefit by considering

whether other kinds of stressors interact with early life experiences to influence the health status of elderly people. For example, research consistently shows that elders are exposed to a range of chronic or ongoing strains, such as persistent financial problems (e.g., Holden, Burkhauser, & Myers, 1986). Moreover, there is some evidence that chronic strain exerts a greater impact on health and well-being than stressful events (Pearlin, Menaghan, Lieberman, & Mullan, 1981). When coupled with the findings in the present study, this research suggests that chronic strain associated with roles that are valued highly may be especially likely to interact with early parental loss to promote physical health problems in late life.

Finally, the OLS regression procedures used in the present study do not take the effects of random measurement error into account. This is an important consideration, because many psychosocial measures contain sizable amounts of random error. More important, research indicates that the unwanted effects of random measurement error may be accentuated when cross-product or multiplicative terms are used in an analysis (e.g., Kenny & Judd, 1984). Although recent advances in latent variable modeling now make it possible to take the effects of random error into account when estimating statistical interaction effects, investigators are warned to use these newly developed procedures with caution because they have not been evaluated fully (Jaccard & Wan, 1996). Consequently, the potential problems created by random measurement error should be kept in mind as further work on early and recent life events is pursued.

Even though there are limitations in the work presented above, the findings have potentially important implications for the development of interventions designed to improve the health of older adults. An important task in designing an intervention is the proper specification of the target group (Sandler, Gersten, Reynolds, Kallgren, & Ramirez, 1988). This has been especially challenging for interventions with a stress-related focus because many elders who are exposed to life events do not subsequently develop physical or mental health problems. The results presented in the present study provide a modest first step toward addressing this issue by helping to identify a more circumscribed, but potentially more vulnerable, group of older adults: elders who lost a parent early in life and who are now faced with stressors arising in roles they value highly.

Life course research is especially challenging because the scope of inquiry is so vast. As the work presented in this study reveals, investigators must straddle events that are spread out across decades in order to better understand the current health status of elderly people. Although the methodological challenges in pursuing this work are daunting, the vantage point it creates, the sweeping view of life that it affords, and the sense of connectedness and continuity that it provides, underscore the unique contributions that gerontologists can make to the research on stress and health. When viewed in this way, the contribution of the present study may not reside in the specific findings that have emerged from the data. Instead, the value may lie in the possibilities that it illuminates.

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