Negative and Positive Health Effects of Caring for a Disabled Spouse: Longitudinal Findings From the Caregiver Health Effects Study

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Data from the first 2 waves of the Caregiver Health Effects Study (n = 680) were analyzed to examine the effects of changes in caregiving involvement on changes in caregiver health-related outcomes in a population-based sample of elders caring for a disabled spouse. Caregiving involvement was indexed by levels of (a) spouse physical impairment, (b) help provided to the spouse, and (c) strain associated with providing help. Health-related outcomes included perceived health, health-risk behaviors, anxiety symptoms, and depression symptoms. Increases in spouse impairment and caregiver strain were generally related to poorer outcomes over time (poorer perceived health, increased health-risk behaviors, and increased anxiety and depression), whereas increased helping was related to better outcomes (decreased anxiety and depression). Results suggest that caring for a disabled spouse is a complex phenomenon that can have both deleterious and beneficial consequences.

Research exploring the effects of caring for an elderly disabled family member has proliferated over the past decade, and a great deal has been learned about the process of caregiving and its effects on informal care providers in community settings (see Chenier, 1997; Kramer, 1997; Kriegsman, Penninx, & van Eijk, 1994; Schulz, O'Brien, Bookwala, & Fleissner, 1995; and Schulz, Visintainer, & Williamson, 1990, for reviews). Despite significant progress, there is strong consensus that future studies should address key issues concerning sampling, study design, and the conceptualization and measurement of caregiver stressors (see Mortimer, Boss, Caron, & Horbal, 1994; Raveis, Siegel, & Sudit, 1990; Schulz et al., 1997; and Zarit, 1994, for critical reviews of caregiver research methodologies). We briefly review some of these issues below and show how the present study is designed to address them.

Methodological and Conceptual Issues in the Existing Literature

Much of what we know about caregiving is based on cross-sectional studies of self-selected samples of relatively distressed caregivers, such as those caring for individuals with advanced dementia (Schulz et al., 1997; Schulz et al., 1995). This approach has been very useful in providing a snapshot of some of the profound challenges of caregiving, but this research is limited with respect to portraying the dynamics of caregiving at less extreme ranges.

In addition, the complexities of characterizing the stressors inherent in caregiving have not been fully explored. Caregiver stress models posit that caring for a disabled relative involves a variety of potential stressors (Pearlin, Aneshensel, Mullan, & Whitlatch, 1996; Pearl in, Mullan, Semple, & Skaff, 1990; Poulshock & Deimling, 1984), both relatively objective (e.g., degree of recipient cognitive or physical impairment, amount of help provided) and subjective (e.g., caregiver burden or strain). However, this distinction has generally not been addressed in the literature linking caregiving to health outcomes. For example, one common strategy is to compare a group of caregivers with a comparison group of noncaregivers in terms of health outcomes, or to compare caregiver samples to population-based norms on morbidity indicators (e.g., Schulz et al., 1995; Schulz et al., 1990). In such studies, caregivers are essentially treated as "equal" or homogenous, and the level or intensity of caregiving stressors has generally been ignored. Such studies do not answer the question of whether intensity of caregiving is associated with the magnitude of health effects.

Other studies without control groups have generally tested only limited aspects of the caregiver stress-health outcome process. Several studies have explored levels of objective stressors (i.e., recipient impairment or help provided) as predictors of subjective stressors (i.e., caregiver burden or strain; see Chenier, 1997, for a recent review), or as predictors of broader health outcomes (e.g., Hinrichsen & Niederehe, 1994; Moritz, Kasl, & Ostfeld, 1992; Poulshock & Resch, 1989). Still others have examined caregiver burden or strain as predictors of health outcomes (e.g., Vitaliano, Russo, & Niaura, 1995; Vitaliano, Russo, Young, Teri, & Maiuro, 1995).
Caregiving demands
(assistance w/daily activities; emotional support)

Appraisal of demands and adaptive capacities

Perceived stress

Positive appraisal

Negative physiological, affective, behavioral, or cognitive responses

Increased risk for mental and physical health problems

Positive physiological, affective, behavioral, or cognitive responses

Decreased risk for mental and physical health problems

1991). Less common are studies that include both objective and subjective aspects of caregiving as predictors of health outcomes, such as depression, anxiety, and physical health, especially among those caring for physically impaired recipients (see Draper, Poulos, Cole, Poulos, & Ehrlich, 1992; Lawton, Moss, Kleban, Glicksman, & Rovine, 1991; and Pruchno, Kleban, Michaels, & Dempsey, 1990, for dementia caregiver studies involving both objective and subjective stressors as predictors of health outcomes). Such studies would provide a more complete picture of the potential range of health effects attributable to varying levels of objective caregiving demands and to changes in levels of caregiver burden or strain.

The Present Study: Theoretical Framework and Research Questions

This study is an attempt to address some of these knowledge gaps and methodological issues in the caregiving literature. We report longitudinal data on the effects of changes in levels of caregiving involvement on changes in caregiver health-related outcomes among elders caring for a disabled spouse. Caregiving involvement is operationalized by three potentially stressful aspects of the caregiving situation: two that are relatively objective and one that is perceptual in nature (see below). Our sample is population based and consists of both (a) elders who are noncaregivers and (b) elders caring for spouses who are essentially in the early stages of physical disability. The analyses also control for the effects of other stressful life events, the quality of the caregiver-care recipient relationship, and the caregiver's own level of physical functioning, in addition to sociodemographic variables.

A recently developed model of the health effects of caregiving (Martire & Schulz, 2000) provides a theoretical framework for this study (see Figure 1). It is derived from generic models of the health-stress process (Cohen, Kessler, & Underwood Gordon, 1995) and includes primary stressors—objective demands, appraisals—subjective reactions, and their effects on longer term mental and physical health outcomes. Like previous models, it also acknowledges either (a) that the effects of objective caregiving demands may be mediated by appraisals or (b) that there may be direct and independent effects of such demands on physical and mental health. The model also explicitly allows for positive as well as negative health effects of caregiving. Not shown in the model are the many moderators and feedback loops that affect the relation between elements of the model. Although a complete test of this model is beyond the scope of the available data, we considered it to be a useful framework for directing the analysis reported here. The model is thus presented as a broad conceptual framework rather than a hypothesized causal structure to be formally tested.

This study explores the direct effects of caregiving demands and perceived caregiver stress on caregiver health-related outcomes.1 We operationalize caregiving demands as the degree of care recipient disability and the amount of help provided by the caregiver. Perceived caregiver stress is conceptualized as the degree of phys-

ical and emotional strain experienced by the caregiver as a result of help provision. Outcome measures include perceived (i.e., self-assessed) health, health-risk behaviors, anxiety symptoms, and depression symptoms. Although these four measures could all be conceived of as “health outcomes” when health is broadly construed, we use the looser term “health-related outcomes,” and we treat them individually in this article. Both positive and negative effects are examined in response to changing levels of caregiving demand and changing levels of perceived stress associated with help provision.

The analyses reported here are based on longitudinal data collected from the first two waves (roughly 1 year apart) of the Caregiver Health Effects Study (CHES), an ongoing, multisite, population-based study of elderly marital dyads. In a cross-sectional analysis of baseline data from this study, Schulz et al. (1997) classified elders into four groups that essentially capture increasing levels of involvement in the caregiving role: Group 1, No Caregiving Controls, who reported that their spouses had no ADL (activity of daily living) or IADL (instrumental activity of daily living) difficulties; Group 2, Living with Disabled Spouse, who reported at least one spouse difficulty but were not providing help to their spouse (although others could be providing help); Group 3, Provides Care to Spouse, who reported at least one spouse difficulty, were providing help for at least one of those difficulties, but did not report any physical or emotional strain related to the provision of help; and Group 4, Reports Caregiving Strain, who reported spouse difficulty, were providing help, and reported physical or emotional strain associated with the provision of help. Schulz et al. compared these groups on a wide range of self-report and objectively assessed mental and physical health status indicators (e.g., anxiety and depression symptoms, perceived health, health behaviors, blood chemistries, medication use). In general, the caregiving groups (i.e., Groups 2, 3, and 4) were less healthy than the noncaregiving controls, with the largest effects occurring for the group at the highest level of caregiver involvement—those reporting caregiver strain (Group 4). It is interesting, however, that health was not a strict linear function of caregiving involvement. On several outcome measures, the group providing help to their spouse but reporting no strain (Group 3) had more positive outcomes than the group living with a disabled spouse but providing no help (Group 2). There seemed to be slight health benefits of providing help to a spouse in need, as long as this did not result in physical or emotional strain. However, given the cross-sectional design, it was difficult to rule out the alternative possibility that better health caused the caregiver to be able to provide help.

In contrast to the cross-sectional group-comparison approach used by Schulz et al. (1997), the analyses reported here use a longitudinal continuous-variable approach to the measurement of potential caregiving stressors in order to more thoroughly explore changes in caregiving involvement as predictors of changes in health-related outcomes. These potential stressors, which were implicit in the Schulz et al. group categorization, include (a) degree of spouse ADL–IADL difficulty, (b) the level of help provided to the spouse by the caregiver, and (c) the level of emotional and physical strain experienced by the caregiver as a result of providing help. Returning to the model in Figure 1, spouse ADL–IADL difficulty and level of help provided are conceptualized as caregiving demands, while caregiver strain is conceived of as an indicator of perceived stress. Two main research questions are addressed in this study:

1. What are the separate effects of changes in spouse physical difficulties, help provided, and caregiver strain on changes in caregiver health-related outcomes?

2. Do changes in the levels of these caregiving involvement variables uniformly predict changes in caregiver outcomes, or are there differential effects, in terms of both magnitude and direction (i.e., positive vs. negative effects), of changes in spouse physical impairment, help provided, and caregiver strain?

Based on the model in Figure 1, we hypothesized that increases in caregiver strain would lead to declines in caregiver outcomes. However, predictions about increased spouse ADL–IADL difficulties and help provided were less straightforward, as these changes could result in health-related declines, improvements, or no effects once caregiver strain is taken into account. The Schulz et al. (1997) baseline cross-sectional findings suggested that there may be benefits to providing help, and this possibility is explored here using longitudinal data.

Method

Sample

Our sample was drawn from the larger Cardiovascular Health Study (CHS) population-based sample of 5,201 individuals (Fried et al., 1991; Tell et al., 1993). The CHS includes one of the largest samples of elderly studied to date and provides descriptive data regarding perceived health status and risk factors for coronary heart disease and stroke in adults 65 years and older. The basic sampling frame was obtained from Medicare Eligibility lists of the Health Care Financing Administration (HCFA). The CHS cohort was recruited from four U.S. communities: Forsyth County, North Carolina; Sacramento County, California; Washington County, Maryland; and Pittsburgh (Allegheny County), Pennsylvania. Each of the four field centers received a tape from HCFA containing a list of 5,000 persons, 65 years and older, in a defined geographic area. Participants were randomly selected and stratified by age and sex at each site to approximate the U.S. population distribution by age and sex.

Persons eligible to participate in the CHS were those living within defined geographic boundaries for each field center who (a) were 65 years or older at the time of enumeration; (b) were community dwelling (i.e., noninstitutionalized); (c) expected to remain in the geographically defined area of the field center for the next 3 years; (d) had no terminal illness and were not enrolled in a hospice program; (e) could fully participate in all procedures of the baseline examination in terms of their physical functioning (e.g., being wheelchair bound in the home was an exclusionary criterion), cognitive ability, hearing, and ability to communicate in the language(s) of the interviewer; and (f) were able to give informed consent and did not require a proxy at baseline. A total of 5,201 individuals were enrolled in the study, approximately 1,300 persons at each site. The overall response rate among those eligible to participate for the original CHS study was 57%. Participants were younger, were more educated, were more likely to be married, and reported generally better health than those who refused. Further details regarding CHS sampling and recruitment can be found in Tell et al. (1995). A supplemental cohort of 687 African American participants was recruited using the same procedures prior to the fourth wave of CHS data collection, resulting in a total sample of 5,888.

For the present study, all individuals in the CHS sample who shared a household and indicated that they were married and living with their spouse were eligible to be recruited into the caregiving (CHES) study (n = 3,185). The goal was to recruit approximately 400 caregivers and 400 controls matched for age and gender. A screening instrument was used to
Data Collection Procedures

Data collection for the caregiver study consisted of structured interviews administered by trained interviewers. The interviews were conducted in the study participants' homes, unless requested otherwise. The interviews for both caregivers and noncaregivers lasted approximately 60 to 90 min and consisted of a broad range of sociodemographic, health, and psychosocial indicators. Measures used in the present study are described in more detail below. Wave 1 CHES data were collected in late 1993–early 1994, and Wave 2 data were collected roughly 1 year later in late 1994–early 1995.

Data collection for the original CHS component of the study took place at local clinic sites, where participants were given extensive physical examinations, in addition to a structured interview assessing medical history, diet, and various psychosocial indicators. Details regarding methods for data collection, equipment used, and primary outcome measures for the CHS study are provided in Fried et al. (1991). The first comprehensive CHS assessment was conducted in 1989–1990 and repeated 3 years later. Less detailed assessments were carried out during interim years. Two CHS measures—stressful life events and the respondent's own level of ADL–IADL difficulty—are included in the analyses presented here. These data were collected in 1993–1994 (during the 5th year of CHS data collection) at roughly the same time that the Wave 1 CHES data were collected. All other measures were taken from the CHES interviews.2

Measures

Sociodemographic variables. Four sociodemographic variables were included in these analyses: (a) age at entry into the CHS cohort (M = 71.5 years, SD = 4.4); (b) race, coded 0 for White (90.4%) and 1 for non-White (9.6%, primarily African American); (c) education, coded as the highest grade or year of school ever completed (22% of the sample had less than a high school education, 25% were high school graduates, 11% had attended vocational–trade school, and 42% had attended college); and (d) gender, coded 0 for female (49.9%) and 1 for male (50.1%).

Additional covariates. Three potential correlates of physical and mental health measured at Wave 1 (1993–1994), were also examined as predictors of changes in caregiver health. An index of Stressful Life Events was administered during the CHS structured interview. A simple count of the number of seven negative life events (the death of someone close, a worsening of an important relationship, an assault or robbery, a negative change of residence, a negative change to the financial situation, a negative job loss—change, and any other significant negative experience) occurring during the 6 months prior to the interview was used for analysis. In addition, during the CHS interview, respondents were asked if, “because of health or physical problems,” they had any difficulty or were unable to perform six ADL (walking, getting in and out of a bed or chair, eating, dressing, bathing, using the toilet) and six IADL tasks (heavy housework, light housework, shopping, preparing meals, managing money, using the telephone). A simple count of the number of the Respondent’s Own ADL–IADL Difficulties (i.e., the number of tasks for which they reported difficulty) was used for analysis. The Quality of the Marital Relationship between the respondent and spouse was assessed during the CHES interview. Fourteen items were used from the Dyadic Relationship component of the Family Assessment Measure (Skinner, Steinhauser, & Santa-Barbara, 1983; Williamson & Schulz, 1990). Respondents were asked to rate the appropriateness of each statement in describing their relationship with their spouse on a scale ranging from 1 (strongly agree) to 4 (strongly disagree). The items tap the areas of communication (e.g., “I know what this person means when he/she says something”), affect expression (e.g., “When I am upset, he/she usually knows why”), and involvement (e.g., “My spouse and I aren’t close to each other”). Items were scored such that higher values meant higher quality relationships. The mean of the 14 items was used for analysis. Cronbach’s alpha for the instrument was .83 in this sample.

Caregiving-involvement variables. Three indicators of involvement in the caregiving role were used. These were assessed at Waves 1 (1993–1994) and 2 (1994–1995) in order to examine the effects of changes in caregiving involvement on changes in health. These included (a) level of spouse ADL–IADL difficulty, (b) the level of help provided to the spouse by the caregiver, and (c) the level of emotional and physical strain experienced by the caregiver as a result of providing help. Respondents were asked, “because of health or physical problems, does your spouse have any difficulty or is (s)he unable . . . ” to perform 6 ADL and 6 IADL tasks (yes or no). (These were the same 12 tasks the respondents reported on in the CHS interview; see above.) Spouse ADL–IADL Difficulty was represented by the number (0–12) of tasks for which the respondent reported spouse difficulty. For those tasks that the respondent reported spouse difficulty, a series of follow-up questions were asked, including a simple yes–no question, “Do you help your spouse with this task?” and questions tapping the degree of emotional and physical strain resulting from helping or arranging help. Help Provided was calculated as the proportion of the ADL–IADL tasks that the spouse had difficulty with for which the respondent actually provided help. Caregiver Strain was calculated as the mean level of emotional and physical strain (0 = no strain, 1 = some strain, 2 = a lot of strain) reported by the respondent as a result of providing help directly to the spouse, or in arranging for help to be provided. There were separate items for emotional and physical strain for each task. For example, a respondent whose spouse had 3 ADL–IADL difficulties was asked six strain questions (one emotional and one physical for each task).3 Note that help provided (a proportion) and caregiver strain (a mean) are both standardized measures that control for absolute levels of spouse difficulty. Noncaregiving control participants who reported no spouse ADL–IADL difficulty received scores of 0 on help provided and caregiver strain.

2 Although the CHS assessment protocol includes a variety of objective, laboratory-based measures of physical health, the majority of these are collected every 3 years rather than yearly (see Fried et al., 1991) and were not available at either time point of interest. Thus, all health-related outcome variables for this study were taken from the CHES interview. We plan future analyses involving longer-term links between caregiving and more objective CHS physical health indicators.

3 The emotional and physical strain items were combined to form a single index because of their fairly high correlation with one another when considered separately (r = .67 at both Wave 1 and Wave 2). This is also consistent with a broad conception of caregiver strain, involving both emotional and physical components.
**Perceived health.** A single item was used to measure participants’ perceived health at Waves 1 and 2. Respondents were asked to describe their health in general on a 5-point scale (1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent). This item has been shown to be strongly related to a variety of objectively assessed physical health status indicators in the larger CHS sample (Schulz et al., 1994). The item has also been a consistent predictor of mortality in numerous studies (see Idler & Benyamini, 1997, for a review).

**Health-risk behaviors.** Health behaviors that could lead to physical health problems were assessed as part of the Waves 1 and 2 CHES interviews. A simple count of the number of seven such behaviors—eating less than three meals a day, not having enough time to exercise; not getting enough rest in general; not being able to slow down and get needed rest when sick; forgetting to take medications; delaying a doctor visit if a health problem is suspected; and missing one or more doctor’s appointments in the last 6 months—was used for analysis. All questions were asked in a yes–no format. These behaviors have been shown to be related to caregiving demands in prior CHES analyses (Burton, Newsom, Schulz, Hirsch, & German, 1997).

**Anxiety and depression symptoms.** As part of the Waves 1 and 2 CHES interviews, respondents completed the Diagnostic Interview Schedule (DIS-III-R) subscales for generalized anxiety disorder and major depressive episode. As part of the diagnostic interview, participants were asked whether they were currently experiencing any symptoms indicative of these disorders. An anxiety score was computed by summing the number out of a possible 20 anxiety-related symptoms reported (e.g., easily startled, restless, particularly irritable, trembly or shaky, feeling dizzy or light headed, having trouble swallowing, sweating a lot). Cronbach’s alpha for this measure was .89 at both Waves 1 and 2. A depression score was calculated by summing the number out of a possible 21 depression-related symptoms reported (e.g., loss of appetite, trouble falling asleep, tired all the time, stay away from people, feel worthless, trouble concentrating, thought a lot about death). Cronbach’s alphas for this measure were .81 at Wave 1 and .85 at Wave 2.

**Attrition Analysis**

The analyses reported here are based on 680 respondents with complete data who were married (or living as married) and participated in the first two waves of the CHES study (381 Wave 1 noncaregivers and 299 Wave 1 caregivers). The loss of the 139 respondents from these analyses (approximately 17% of the original 819) was due to three factors: (a) CHES dropout at Wave 2 (n = 63), (b) death of the spouse between Wave 1 and Wave 2 (n = 45), and (c) missing CHS or other data (n = 32). Widows and widowers who had essentially relinquished the caregiving role were not included because the present study focused on changes in the level of caregiving. Two of the covariates used (negative life events and caregiver’s own ADL-IADL limitations) were collected during a separate CHS clinic visit (see data collection procedures above), which 23 of the respondents missed. In addition, 5 respondents had missing data on education, and 4 were missing scores for quality of marital relationship.

The CHES dropouts, widows, and other missing data groups were compared with the 680 survivors in terms of sociodemographic variables, Wave 1 caregiving-involvement variables, and Wave 1 perceived health, health-risk behaviors, and anxiety and depression symptoms. In sum, the survivors, who were the focus of these analyses, had less disabled spouses, provided less help, and experienced less caregiver strain at baseline than those who became widowed between Waves 1 and 2. Widows also reported more health-risk behaviors and were more anxious at baseline than the survivors. In addition, the sociodemographic analyses showed that the survivors were somewhat younger and more educated than the CHES dropouts. There were no other differences between survivors and dropouts. In sum, the survivors included in these analyses are likely to be somewhat younger, more educated, and healthier than the general population of elders. Although this differential attrition is a common occurrence in longitudinal studies of the elderly and is certainly not unique to this study, these potential sampling biases should be kept in mind when interpreting the results.

**Analytic Strategy**

The primary interest in this study was on the effects of changes in the level of involvement in caregiving on changes in perceived health, health-risk behaviors, and anxiety and depression symptoms. Given the availability of two waves of data, a change-score regression approach was used (Kessler & Greenberg, 1981). In these analyses, perceived health, health-risk behavior, anxiety, and depression change scores (Wave 2–Wave 1) were regressed hierarchically onto three sets of variables: (a) the Wave 1 outcome score (which makes the dependent variable a residualized change score), sociodemographic variables (age, race, education, gender), stressful life events, respondent ADL-IADL difficulty, and quality of the marital relationship (all assessed at Wave 1); (b) Wave 1 caregiving-involvement variables (spouse ADL-IADL difficulty, help provided, caregiver strain); and (c) caregiving-involvement change scores (Wave 2–Wave 1). The test at Step 1 concerns whether the sociodemographic variables or the other covariates predict changes in health-related outcomes between Waves 1 and 2, whereas at Step 2 the prospective effects of baseline caregiving involvement on changes in the outcome measures over the next year are assessed. Step 3 provides the critical test of whether changes in caregiving involvement predict additional variance in changes in health-related outcomes. In addition, at the final step of the model, Wave 1 caregiving effects can be interpreted as a stable component, and the change score as an acute change component, of the effects of caregiving on changes in the outcome measures.

**Results**

Results are presented in two major sections: (a) descriptive statistics and bivariate correlations (Table 1) and (b) longitudinal hierarchical regressions of changes in health-related outcomes onto changes in caregiving involvement (Tables 2–5).

**Descriptive Statistics and Bivariate Correlations**

Correlations among study variables and descriptive statistics are presented in Table 1. In terms of descriptive statistics for caregiving involvement, slightly more than half the sample were noncaregiver control participants who reported that their spouse had no ADL–IADL difficulties (n = 381, or 56% at Wave 1; n = 376, or 55% at Wave 2). Among those reporting at least one spouse ADL–IADL difficulty at Wave 1, the mean number of difficulties was between three and four. Approximately 35% of the caregivers reported only a single spouse difficulty; 35% reported two, three, or four difficulties; and 30% reported that the spouse had difficulty with five or more tasks. The distribution of spouse ADL–IADL difficulty was similar at Wave 2. The most common diseases or conditions that caused the spouses’ disabilities were stroke and arthritis and, to a lesser extent, heart disease and memory problems–dementia. At Wave 1, the median number of years that the spouse had had ADL–IADL difficulty was three.4 The average caregiver was helping the spouse with 70% of the tasks that he or she had difficulty with and was experiencing relatively low levels

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4 Entering baseline length of caregiving, as indicated by the maximum number of years the spouse had had difficulty with any ADL–IADL task, into the regression analyses presented here did not change the results. Nor did length of caregiving predict changes in health-related outcomes. Thus, this variable was not included in the analyses reported here.
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<td>.28*</td>
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<td>.20</td>
<td>-.01</td>
<td>-.08</td>
<td>-.29</td>
<td>.17</td>
<td>-.12</td>
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<td>Health-risk behavior</td>
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<td>-.11</td>
<td>.18</td>
<td>.14</td>
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<td>.37</td>
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<td>DIS anxiety</td>
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<td>-.02</td>
<td>-.05</td>
<td>.22</td>
<td>.09</td>
<td>-.15</td>
<td>.25</td>
<td>.10</td>
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<td>-.20</td>
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<td></td>
<td>.47</td>
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<td>-.06</td>
<td>.01</td>
<td>-.05</td>
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<td>.07</td>
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<td>.42</td>
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<td>.89</td>
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<td>W2 M</td>
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<td>.67*</td>
<td>.26*</td>
<td>.33</td>
<td>.68</td>
<td>.54</td>
<td>.15</td>
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<tr>
<td>W2 SD</td>
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<td>1.82</td>
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</table>

**Note.** NW = non-White; M = male; CG = caregiver; ADL = activity of daily living; IADL = instrumental activity of daily living; DIS = Diagnostic Interview Schedule. Entries above the diagonal are Wave 1 correlations; those below the diagonal are Wave 2 correlations. Only Wave 1 scores were used for age, race, education, gender, stressful life events, CG ADL-IADL difficulties, and quality of marital relationship. Correlations of ±.08 are significant at the .05 level; correlations of ±.10 are significant at the .01 level; correlations of ±.14 are significant at the .001 level.

* M and SD for those who report that their spouse has at least one ADL-IADL difficulty at Wave 1 (n = 299) and Wave 2 (n = 304).  \(^b\) n = 676 (Wave 1) and n = 679 (Wave 2) for all correlations involving perceived health due to missing data.
of physical and emotional strain as a result (a mean of about 0.3 on a scale ranging from 0 to 2). Descriptive statistics for Wave 2 help provided and caregiver strain were similar to those from Wave 1. In terms of changes in levels of spouse disability, 59% of the sample reported the same number of spouse ADL-IADL difficulties at Waves 1 and 2 (49% reported none at either wave), 24% reported increased difficulties, and 17% reported fewer difficulties. Similar results for changes in help and strain were found—61% reported no change in the proportion of tasks with which they helped their spouse, 20% reported less help, and 19% reported increased help; 74% reported no change in caregiver strain level, 13% reported less strain, and 13% reported increased strain. Thus, the key independent variables—changes in caregiving involvement—were leptokurtic (i.e., the majority of participants exhibiting no change), and they were essentially symmetrically distributed (i.e., nonskewed).

Turning to perceived health, health-risk behaviors, and DIS-II-R anxiety and depression symptoms, the sample examined in these analyses was relatively healthy. The average respondent perceived his or her health to be between good (3) and very good (4), reported less than one health-risk behavior, and reported low levels of psychiatric symptoms, especially depression symptoms (i.e., means of less than one symptom). Health-related outcomes were poorer (p < .01) among those reporting at least one spouse ADL-IADL difficulty (perceived health, \( M = 3.2 \) vs. \( M = 3.6 \) for noncaregivers; number of health-risk behaviors, \( M = 0.97 \) vs. \( M = 0.52 \); anxiety symptoms, \( M = 0.95 \) vs. \( M = 0.34 \); depression symptoms, \( M = 0.31 \) vs. \( M = 0.09 \) at Wave 1; results were similar at Wave 2). As was the case for the caregiving-involvement indexes, although the majority of the sample was stable in terms of the outcome measures between Waves 1 and 2 (61% gave the same response to the perceived health item, 60% reported equal numbers of health-risk behaviors, 77% reported equal numbers of anxiety symptoms, and 93% reported equal numbers of depression symptoms), the changes that did occur were in both directions. Whereas slightly more respondents reported decreased perceived health (24%) than improvement (15%), roughly equal numbers of respondents reported fewer as compared with more health-risk behaviors and psychiatric symptoms. Thus, changes in health-related outcomes (the dependent variables) also revealed leptokurtic, non-skewed distributions.5

5 The positively skewed distributions of the Wave 1 and Wave 2 caregiving-involvement and psychiatric-symptom variables were cause for concern in the context of regression analyses. However, the major focus of the analyses presented here were changes in caregiving involvement and changes in health-related outcomes, which, while leptokurtic, revealed symmetric (i.e., nonskewed) distributions. Nonetheless, we did perform log transformations on the caregiving-involvement and psychiatric-symptom outcome variables prior to the calculation of difference scores and estimation of the regression models. Major results were not affected, and thus we present nontransformed results.
Table 3
Regression of Change in Health-Risk Behaviors (HRB) Onto Changes in Caregiving Involvement (n = 680)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Zero-order correlation</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
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<td></td>
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<td>Wave 1 HRB</td>
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<td></td>
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<td>-.44***</td>
<td>-.50***</td>
<td>-.56***</td>
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<td></td>
<td>Age</td>
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<td>-.04</td>
<td>-.06</td>
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<td></td>
<td>Race (1 = NW)</td>
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<td>.13***</td>
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<td>Education</td>
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<td>-.05</td>
<td>-.04</td>
</tr>
<tr>
<td></td>
<td>Gender (1 = M)</td>
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<td>Life events</td>
<td>.03</td>
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<td>.02</td>
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<td></td>
<td>CG ADL–IADL</td>
<td>.03</td>
<td>-.09***</td>
<td>-.06</td>
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<td>Wave 1 caregiving involvement</td>
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<tr>
<td></td>
<td>Spouse ADL–IADL</td>
<td>.04</td>
<td>.13**</td>
<td>.13**</td>
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<tr>
<td></td>
<td>Help provided</td>
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<td>-.05</td>
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<td></td>
<td>CG strain</td>
<td>.07</td>
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<td>.34***</td>
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<td></td>
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<td>Spouse ADL–IADL</td>
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<td>.10**</td>
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<td>CG strain</td>
<td>.08*</td>
<td>.27***</td>
<td>.336</td>
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<td>2.78</td>
<td>3.36</td>
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<td>R² change</td>
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<td>.040***</td>
<td>.058***</td>
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<td>Overall df</td>
<td>8,671</td>
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Note. NW = non-White; M = male; CG = caregiver; ADL = activity of daily living; IADL = instrumental activity of daily living. Zero-order correlations are between the predictor and unresidualized change in health-risk behaviors (i.e., Wave 1 health-risk behaviors are not controlled). Table entries for models are standardized betas. The dependent variable is change in health-risk behaviors (i.e., a T2–T1 change score).

* Variance accounted for by demographic—control variables in addition to Wave 1 health-risk behaviors, which accounted for 19.4% of the variance.

* p < .05. ** p < .01. *** p < .001.

In terms of bivariate correlations at Waves 1 and 2, sociodemographic variables were only weakly related to health-related outcomes, higher stressful life event scores and respondent ADL–IADL difficulty scores were related to poorer outcomes, and higher quality marital relationships were related to better outcomes. At the bivariate level, greater caregiving involvement was related to poorer health-related outcomes cross-sectionally at both waves. Note that there were moderate-to-high correlations among the caregiving-involvement variables at both waves and that perceived health was negatively correlated with health-risk behaviors and anxiety and depression symptoms, which were positively correlated with one another. Correlations between caregiving-involvement change scores (not shown in Table 1) were as follows: change in spouse needs and change in help (r = .30), change in spouse needs and change in caregiver strain (r = .13), change in help and change in caregiver strain (r = .25).6 Zero-order correlations between changes in caregiving involvement and changes in health-related outcomes are reported in the first column of Tables 2–5. These correlations are generally weak and nonsignificant, although increased caregiver strain was significantly correlated with increases in health-risk behaviors (see Table 3). It is also interesting to note that increased helping was related to decreased anxiety and depression symptoms (in contrast to the positive

6 The moderate-to-high cross-sectional baseline correlations among spouse need, help, and strain (ranging from .52 to .65) were potential causes of multicollinearity problems for the regression analyses. However, the key predictors of interest were changes in caregiving involvement, which were less highly intercorrelated (ranging from .13 to .30). In addition, collinearity diagnostics for the baseline caregiving variables at Step 2 of the regression analyses (when they were first entered) revealed VIF (Variance Inflation Factor) statistics of about 2.0 for spouse need and help, and 1.7 for strain. Thus, less than half the variance of these variables is accounted for by other variables in the model. VIF statistics for change in spouse need (1.3) and change in help (1.6) were even more acceptable (change in strain had a VIF of 1.7, same as the baseline value). VIF statistics in this range are not generally considered problematic (e.g., Fox, 1991). It should also be noted that the change-score VIF statistics are inflated by the naturally occurring negative correlations between change scores and the prescore (r = .23 for need, .46 for help, .50 for strain), which were also in the equation. In sum, although there are correlations among the predictors of interest, multicollinearity does not appear to be of major concern, especially for the key change-score predictors. More important, our major interest in this article is on the independent effects of various aspects of the caregiving process—spouse disability, helping behavior, and caregiver strain. Eliminating variables or creating a single caregiving construct to reduce multicollinearity are thus not reasonable options for substantive reasons.
cross-sectional associations), though these correlations were not significant.

In sum, the sample examined here can be characterized as relatively healthy and, when providing care, helping a spouse in the early stages of physical decline. Respondents became both more and less involved in the caregiving process and experienced improvements as well as declines in health-related outcomes. We turn now to results addressing the major focus of the present study, which concerns the effects of changes in levels of involvement in caregiving on changes in caregiver outcomes.

**Predicting Changes in Health-Related Outcomes With Changes in Caregiving Involvement**

**Perceived health.** Results for the single-item indicator of perceived health are presented in Table 2. (For descriptive-comparative purposes, the first column in Tables 2–5 shows bivariate or unadjusted correlations between each predictor and the outcome change score.) At Step 1, sociodemographics and the other covariates accounted for 2.3% of the variance in changes in perceived health ($p < .05$). (Wave 1 perceived health accounted for 12.7% of the variance. Baseline perceived health was negatively correlated with change, which was also the case for the other outcome measures.) Respondents with higher levels of education tended to report improved health, whereas those with higher levels of ADL-IADL difficulties at Wave 1 tended to have perceived health declines. Wave 1 caregiving-involvement indicators did not account for a significant amount of additional variance in changes in perceived health. However, at the last step, changes in caregiving involvement accounted for an additional 1.3% of the variance ($p < .05$) in changes in perceived health. Increases in caregiver strain were predictive of decreases in perceived health. Neither changes in the number of spouse ADL-IADL difficulties nor amount of help provided predicted changes in perceived health. Finally, note that there appears to be both a stable (i.e., Wave 1 caregiver strain was significant at the last step) and an acute change component to the effects of caregiver strain on changes in perceived health. Respondents with characteristically high levels of caregiver strain, as well as those experiencing increases in strain, were likely to report declines in perceived health. The final model accounted for an adjusted 15.0% of the variance.

**Health-risk behaviors.** Results from the regression of change in number of health-risk behaviors onto changes in caregiving involvement are presented in Table 3. The sociodemographic variables and other covariates accounted for 4.4% of the variance in changes in health-risk behaviors ($p < .001$). (Wave 1 health-risk behaviors accounted for 19.4% of the variance.) African American caregivers and those reporting more stressful life events at Wave 1 reported more health-risk behaviors, whereas those in...
higher quality marital relationships tended to report fewer, although only the race effect remained once caregiving involvement was entered. At Step 2, wave 1 caregiving-involvement variables accounted for an additional 4.0% of the variance (p < .001). Higher baseline levels of spouse ADL-IADL difficulties and caregiver strain prospectively predicted increases in health-risk behaviors between Waves 1 and 2. At the final step, changes in caregiving involvement accounted for an additional 5.8% of the variance (p < .001). Increases in spouse ADL-IADL difficulties and caregiver strain were predictive of increased health-risk behaviors, and there were both stable and acute change components to these effects, in addition to the pure prospective effects found at Step 2. Changes in the proportion of ADL-IADL tasks the participant helped the spouse with were not related to changes in health-risk behaviors. The final model accounted for an adjusted 32.2% of the variance.

Anxiety symptoms. Results from the regression of change in DIS-III-R anxiety symptoms onto changes in caregiving involvement are presented in Table 4. The sociodemographics—covariates accounted for 2.2% of the variance in change in anxiety symptoms (p < .01). (Wave 1 anxiety symptoms accounted for 36.6% of the variance.) Respondents reporting more stressful life events at Wave 1 tended to show increases in anxiety. In addition, participants in higher quality marital relationships tended to report fewer anxiety symptoms, although this effect weakened once caregiving involvement was entered. Wave 1 caregiving-involvement variables accounted for an additional 1.9% of the variance at Step 2 (p < .001). Higher levels of baseline caregiver strain prospectively predicted increases in anxiety between Waves 1 and 2. At the last step, changes in caregiving involvement accounted for an additional 2.4% of the variance in change in anxiety (p < .001). Increases in the number of spouse ADL-IADL difficulties and the level of caregiver strain were related to increased anxiety, whereas increases in the amount of help provided were related to decreased anxiety. Note again that there appears to be both a stable and an acute change component to the effects of caregiver strain on changes in anxiety (i.e., Wave 1 caregiver strain was significant at the last step), in addition to the pure prospective effect found at Step 2. The final model accounted for an adjusted 41.9% of the variance.

Depression symptoms. Results for changes in depression symptoms are presented in Table 5. The sociodemographic variables and other covariates did not account for a significant amount of the variance in change in depression, and none of the variables was individually predictive. (Wave 1 depression symptoms accounted for 35.4% of the variance.) Although the Wave 1 caregiving-involvement variables accounted for a significant (p < .05) 0.8% of the variance at Step 2, none of the individual variables were significantly related to changes in depression in a prospective sense. At the final step, changes in caregiving involvement ac-
counted for an additional 1.8% of the variance in change in depression (p < .001). Once again, increased caregiver strain was related to increased depression symptoms, while increases in amount of help provided to the spouse predicted decreases in depression. Note once again that both the stable and acute change aspects of caregiver strain were related to changes in depression. The final model accounted for an adjusted 37.7% of the variance.

In sum, higher caregiver strain was consistently predictive of negative changes in all four health-related outcomes, and changes in spouse ADL–IADL difficulties and help provided to the spouse were also predictive of changes in caregiver outcomes. Increases in spouse physical difficulties were related to increased health-risk behaviors and anxiety symptoms, whereas increased help was predictive of decreased anxiety and depression symptoms.

Discussion

This study represents an attempt to address knowledge gaps and methodological issues of previous caregiver outcomes research. We report longitudinal data on the effects of changes in caregiving involvement on changes in caregiver health-related outcomes, controlling for sociodemographic variables. Also examined for their effects are other stressful life events, respondent physical functioning, and the quality of the marital relationship between the caregiver and her or his spouse. Our sample is population-based and consists of noncaregivers as well as elders caring for spouses who are essentially in the early stages of physical disability.

Our analyses revealed that, after controlling for sociodemographic variables and the other covariates, increases in help provided were related to decreased anxiety and depression. Thus, at least along this dimension, greater caregiving involvement was related to better mental health. This appears to be a change-related, dynamic phenomenon, as the cross-sectional relationships between help provided and anxiety and depression were positive at both time points. At the same time, as hypothesized, increases in caregiver strain resulting from help provision were consistently predictive of poorer outcomes (i.e., poorer perceived health, increase in health-risk behaviors, and increase in anxiety and depression symptoms). This finding that domain-specific (i.e., caregiving) stress relates to more generalized distress is consistent with previous caregiver health-effects research (e.g., Schulz et al., 1995). Finally, changes in spouse physical impairment levels were also related to poorer health-related outcomes. Increased spousal impairment related to increased health-risk behaviors and anxiety, which is also generally consistent with previous research (Burton et al., 1997; Schulz et al., 1997). In sum, our results suggest that caring for a disabled spouse is, on balance, a stressful experience with deleterious consequences. However, at the same time, caregivers may derive some mental health benefits from helping a spouse in need. These findings are thus consistent with the general model shown in Figure 1, which suggests the possibility of both positive and negative effects of caregiving.

It should be noted that the magnitude of these effects was relatively small, with changes in caregiving involvement explaining only between about 1% and 6% of the variance in changes in health-related outcomes. Thus, the results require replication in other samples. These modest effect sizes may be in part a function of the relatively small amounts of change observed in both the independent and dependent variables. The typical respondent was stable in terms of both caregiving involvement and health-related outcomes over the 1-year observation period. A related issue is that this study involved a sample of caregivers whose spouses were in the early stages of disability, and thus they were providing relatively low levels of care. In one sense, these qualifying conditions make the results somewhat more impressive. These effects might have been stronger with a sample of more impaired care recipients or caregivers showing more change in their levels of caregiving involvement. Alternatively, caregivers in the later stages of their caregiving careers might not benefit from increased helping. Additional follow-up data collected as the sample ages and becomes more severely disabled are needed to clarify these issues.

The findings provide clarification of the cross-sectional group comparison data reported by Schulz et al. (1997) using the same data set. In that study, although the caregiving groups were less healthy than noncaregiving controls, health was not a strict (negative) linear function of caregiving involvement. The most involved group—those helping a disabled spouse and reporting caregiver strain (Group 4)—was the least healthy, followed by those living with a disabled spouse but not helping (Group 2). The group providing help but reporting no strain (Group 3) was most like the control group (Group 1) in terms of health. These between-subjects data were suggestive not only of negative health effects as a result of the spouse moving from healthy to disabled (i.e., Group 1 to Group 2), and of moving from helping without strain to helping with strain (i.e., Group 3 to Group 4), but also of health benefits associated with moving from not helping to helping a disabled spouse without strain (i.e., Group 2 to Group 3). This study provides within-subject longitudinal confirmation of such a pattern of effects—increased strain and impairment producing negative effects, but increased helping resulting in positive effects—using a continuous variable approach.

The apparently beneficial effects of helping are also consistent with the broader, emerging literature on the potentially positive aspects of stressful events (see Aldwin, 1994, for a review), as well as with evidence suggesting the beneficial effects of providing support to others later in life (Krause, Herzog, & Baker, 1992). However, to our knowledge, mental health benefits as a result of helping have not been previously reported in samples of spousal caregivers of the physically disabled. Among caregivers of Alzheimer’s patients, amount of help provided either has not been predictive of depression (Dura, Stukenberg, & Kiecolt-Glaser, 1991; Kiecolt-Glaser, Dura, Speicher, Trask, & Glaser, 1991; Pruchno et al., 1990) or has been found to predict higher levels of depression (Baumgarten et al., 1992; Fillemer & Sitter, 1996; Russo, Vitaliano, Brewer, Katon, & Becker, 1995). One study of Alzheimer’s caregivers did find that amount of help provided was related to less depression and more positive affect, but this was limited to adult-child caregivers (Lawton et al., 1991). There is some evidence from the positive aspects of caregiving literature that greater amounts of help are related to greater caregiver gain or satisfaction (see Kramer, 1997, for a review), but other studies have found helping to be related to reduced satisfaction (Walker, Accock, Bowman, & Li, 1996) or to both greater satisfaction and increased caregiver burden (Lawton et al., 1991). Clearly, the nature of the mechanisms responsible for mental health benefits of helping among caregivers, and the conditions under which such benefits occur, need to be explored further.
The precise nature of the relationships between caregiving and health among elderly caregivers also needs to be more thoroughly specified. For example, this study found evidence for the effects of changes in caregiving involvement on changes in health-related outcomes. It is also possible that changes in health lead to changes in caregiving. Not only can increased help lead to decreased anxiety or depression, but the reverse may also be true—perhaps decreased psychiatric symptoms cause a caregiver to be more able to provide help. However, additional supplemental analyses in which change in help was regressed onto change in anxiety and depression revealed that neither anxiety nor depression were significant prospective, stable, or acute change predictors of changes in level of help provided to the spouse. Thus, the assumed causal mechanism (i.e., caregiving leads to health, see Figure 1) was supported by the data to a greater extent than the reverse mechanism. Nonetheless, the possibility of reciprocal causality between caregiving and health should be explored in future studies.

Despite our attempts to address some of the sampling and design-related shortcomings of previous caregiver health-effects research, this study is limited by the fact that the data are based entirely on caregiver reports. Thus, for example, there was no independent or truly objective assessment of spouse physical impairment or the amount of help provided to the spouse. As a result, our indicators of caregiving demand also involved a perceptual component. We realize that there is the potential for bias in reports of others’ and one’s own physical symptoms or in the amount of assistance being provided and that these biases may be systematically related to certain personality traits (see Bookwala & Schulz, 1998). Care recipient data would have been a useful validation tool in this regard. We plan to conduct future analyses involving both members of the marital dyad to explore this issue. Last, although the population-based sampling strategy used is a strength of the research, the relatively low initial CHS response rate (57%) is likely to have resulted in some sampling biases toward younger, more educated, and healthier elderly than in the general population.

Conclusions and Implications

This study suggests that increasing levels of involvement in caregiving can have both deleterious and beneficial effects under certain conditions. Watching a spouse lose the ability to perform tasks that have been a routine part of life can be a painful experience. Becoming physically or emotionally strained as a result of caregiving-involvement continuum, to conduct longitudinal research in order to examine how the process of caring for a disabled family member evolves over time, and to design studies that take the multidimensional nature of caregiving into account.

References


NEGATIVE AND POSITIVE HEALTH EFFECTS


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