

**All in the Family:
The Impact of Caring For Grandchildren on Grandparents' Health**

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ABSTRACT

Objectives: To examine the effects of caring for grandchildren on health behaviors and mental and physical health among older adults.

Methods: Using a sample of 12,872 grandparents ages 50-80 from the Health and Retirement Study, we examine the relationship between stability and change in various types of grandchild care and subsequent health, controlling for covariates and earlier health.

Results: We find no evidence to suggest that caring for grandchildren has dramatic and widespread negative effects on grandparents' health and health behavior. We find limited evidence that grandmothers caring for grandchildren in skipped-generation households are more likely to experience negative changes in health behavior, depression and self-rated health and some evidence of benefits to grandmothers who babysit.

Discussion: Our findings suggest that the health disadvantages found previously among grandparent caregivers arise from grandparents' prior characteristics, not as a consequence of providing care. Health declines as a consequence of grandchild care appear to be the exception rather than the rule. These findings are important given continuing reliance on grandparents for daycare and increasing reliance on grandparents for custodial care. However, they should be tempered by the recognition that for a minority of grandparents, coresidential grandchild care may compromise health.

In the United States, family assistance typically flows down the generations, especially from parents to adult children (Eggebeen & Hogan, 1990; Rossi & Rossi, 1990; Soldo & Hill, 1993). An important type of assistance involves caring for the next generation. Although the fraction of children cared for by grandparents declined as formal childcare expanded, grandparents remain an important source of childcare for a sizeable fraction of working parents (Bowers & Myers, 1999; Fuller-Thomson & Minkler, 2001; Hofferth, 1996). At the same time, the proportion of grandparents providing coresidential care for grandchildren increased (Lugaila, 1998). Some grandparents assume responsibility for raising a grandchild when the parents are unavailable due to substance abuse, illness, or incarceration (Goodman & Silverstein, 2002; Kelley, Yorker, & Whitley, 1997). Other grandparents share responsibility for grandchildren in response to their adult child's financial need, divorce, or work commitment (Musil & Ahmad, 2002).

Grandparents caring for grandchildren provide a critical service for both the children and the children's parents. Like other care work, this service has public, as well as private, benefits; relying on grandparents to care for or raise their grandchildren conserves public resources and sidesteps debates over public responsibility. However, as grandchild care has become more visible, concerns have arisen that these benefits may come at the cost of grandparents' well-being (e.g. Minkler, 1999). The impact of caring for grandchildren on grandparents' health is a particular focus of concern.

These concerns stem from the recognition that caring for grandchildren adds a considerable demand to a grandparent's life. A large literature suggests that the exertion and stress associated with fulfilling these demands will exact a health toll (Grinstead, Leder, Jensen, & Bond, 2003). The day-to-day care of children, especially very young children, is physically taxing and can involve loss of sleep and exposure to infections (Jendrek, 1993). These physical demands may be magnified if grandchild care coincides with the onset of physical aging. Time pressures and

added emotion work may lead to feelings of stress and overload (Jendrek, 1993). Furthermore, grandchild care, particularly custodial care, is non-normative. Perceiving caregiving as “off-time” and sacrificial may lead to grandparents feeling isolated and resentful (Minkler, Fuller-Thomson, Miller, & Driver, 1997). Lack of institutional recognition and support can make daily life more difficult and increase stress (Minkler, 1999).

In addition to these direct effects, grandchild care affect health indirectly through associated changes in lifestyle, relationships and social roles (Szinovacz, DeViney, & Atkinson, 1999). Caring for grandchildren reduces time for self-care, such as exercise and going to the doctor (Roe, Minkler, Saunders, & Thomson, 1996) and time for hobbies and socializing (Pruchno, 1999). The stress of caregiving may cause or exacerbate poor health behavior, such as smoking (Burton, 1992; Waldrop & Weber, 2001). Caring for a grandchild may strain relationships with a spouse or partner, with the child’s parent or with other children or grandchildren (Bowers & Myers, 1999; Weber & Waldrop, 2000). Caregiving grandparents may reduce hours of paid employment, which may lead to financial distress (Minkler & Roe, 1996).

Although the demands of grandchild care are real, whether they trigger health change is likely to depend on the characteristics and context of the caregiving situation (cf. Minkler et al., 1997; Szinovacz et al., 1999). First, the nature of demands will vary across caregiving arrangements. For example, custodial care is generally more demanding than babysitting and very young children, teenagers, and children with health or behavior problems more demanding than grade-school children with few problems (Bowers & Myers, 1999; Giarrusso, Feng, Wang, & Silverstein, 1996; Sands & Goldberg-Glen, 2000). If grandchild care is the result of problems in the adult child’s life, it may be associated with feelings of loss, pain and guilt over perceived failures as a parent (Minkler et al., 1997) and conflict with this child may increase stress (Waldrop & Weber, 2001). Combining caregiving with other roles, such as paid employment,

may increase time pressure and exhaustion (Pruchno, 1999). The extent to which grandchild care is actually perceived as demanding will depend on the meaning a grandparent attaches to grandparent and caregiving roles and to family connections (Pruchno & McKenney, 2002) and whether grandchild care is considered non normative may vary by race/ethnicity and social class (Goodman & Silverstein, 2002).

Second, grandchild care also brings benefits, which in a given situation may mitigate or even outweigh caregiving demands. Caregiving is positively affirming, so grandparents may find caring for a grandchild rewarding (Pruchno & McKenney, 2002). Caregiving grandparents report feeling closer to their grandchildren and enjoying time spent with them (Pruchno, 1999). Caring for a grandchild may lead to a more active lifestyle, healthier meals or a reduction in smoking. Some grandparents feel that caring for their grandchildren has made them healthier and more active (Waldrop & Weber, 2001).

Third, whether grandchild care affects health will depend on the *balance* between the demands of caregiving and the resources available to the grandparent (Hughes & Waite, 2002). All else equal, a financially secure, healthy grandmother is better able to meet the demands of grandchild care than an impoverished grandmother with mobility limitations from diabetes. Married grandparents bring the resources of two people to bear on the situation. Social support is an important resource for caregiving grandparents (Grinstead et al., 2003) and caregiving grandparents may experience increases in social support as they mobilize resources to cope (Szinovacz et al., 1999). However, as kin caregivers, grandparent caregivers receive fewer institutionally based supports than non-kin caregivers (Grinstead et al., 2003); this deficit may cause grandparents, especially those who lack other resources, to be overwhelmed by the demands of grandchild care.

The balance between caregiving demands and available resources is unclear a priori.

However, a growing literature suggests that for many people, the net health effects of grandchild care are negative. Grandparents raising grandchildren are more likely to report activity limitations than other grandparents (Fuller-Thomson & Minkler, 2000; Minkler & Fuller-Thomson, 1999). These grandparents also rate their health more negatively, report more health problems and are less satisfied with their health (Giarrusso et al., 1996; Minkler & Fuller-Thomson, 1999; Musil & Ahmad, 2002; Solomon & Marx, 1999; Waldrop & Weber, 2001). Co-resident grandparent caregivers report poorer physical health than noncaregivers and caregiving grandmothers experience increased risks of coronary heart disease (Lee, Colditz, Berkman, & Kawachi, 2003; Strawbridge, Walhagen, Shema, & Kaplan, 1997).

A number of studies show higher depressive symptoms among both custodial (Minkler et al., 1997) and co-parenting (Musil & Ahmad, 2002; Musil, 1998) grandparents than among non-residential grandparents (Caputo, 2001; Fuller-Thomson & Minkler, 2000) and other non-caregivers (Strawbridge et al., 1997). Szinovacz and colleagues (1999) find increases in depression among grandmothers whose grandchild moves in, particularly when neither of the child's parents moves in. The continued presence of a grandchild does not increase depression unless the child's parent also lives in the household. Similarly, a recent longitudinal study finds an elevated risk of depression among co-resident grandparent caregivers (Blustein, Chan, & Guanais, 2004).

However, the research designs used in most studies limit out ability to make causal connections between caring for grandchildren and grandparents' health (Strawbridge et al., 1997). Most studies assess the cross-sectional relationship between grandchild care and grandparents' health; some of these studies are also unable to control for important covariates. Thus the relationships found may reflect initially poorer health among grandparents who provide care to grandchildren, characteristics that place these grandparents at greater risk of health

decline, a causal effect of caregiving on health or some combination.

In addition, many studies use non-representative samples. Some, though not all, of these samples consist of grandparents at the most demanding end of the caregiving spectrum, such as grandparents raising children whose parents are addicted to drugs and/or grandparents living in poverty. Thus whether the relationships observed can be generalized to the entire population of caregiving grandparents is unclear. Even in more general studies, the comparison group is often not ideal. Some studies compare coresidential grandparents to grandparents without coresident grandchildren. But grandparents who do not live with grandchildren may provide babysitting, blurring the comparison. Studies that find weak or nonexistent relationships between grandchild care and grandparents' health (see Grinstead et al., 2003) increase uncertainty about the link between grandchild care and grandparents' health.

Finally, the three longitudinal studies that employ nationally representative data all examine mental health (Blustein et al., 2004; Minkler et al., 1997; Szinovacz et al., 1999). However, physical health is equally important, especially for persons on the threshold of old age. In addition, as described above, the time burdens associated with childcare may limit time for self-care and lead to shifts in health behavior.

In this paper, we provide a context for the cross-sectional and focused studies referenced above. We assess the longitudinal relationship between various types of grandchild care and multiple dimensions of grandparents' health in a nationally representative sample. We assess two-year changes in health and health behavior by comparing the health of different types of grandparent caregivers to grandparents who do not provide care, controlling for initial health and health behavior and important covariates. Because we know less about the relationship between grandparents' health and nonresidential grandchild care, we examine the health effects of various levels of babysitting explicitly. We examine the effects of starting care, continuing care and

stopping care separately; previous research has shown differences between grandparents initiating and continuing care (Szinovacz et al., 1999). Most research focuses on grandmothers; we examine grandchild care and health among grandmothers and grandfathers.

Our analysis is designed to address two questions. First, is caring for grandchildren associated with grandparents' subsequent health, net of grandparents' characteristics and prior health? The situations precipitating care for grandchildren among grandparents are likely related to characteristics themselves associated with poorer health and greater likelihood of health decline (Strawbridge et al. 1997). Thus we expect grandchild care to be associated with poorer subsequent health in bivariate models, but expect these associations to attenuate or disappear in multivariate models including grandparents' characteristics and prior health. Second, are any remaining relationships between grandchild care and grandparents' health generalized or are they observed only among certain types of caregivers? Above, we emphasize how context and circumstances are likely to shape the experience and consequences of caregiving. Thus we do not expect to observe widespread health decline in our representative sample of grandparent caregivers. To the extent that we do observe deleterious health effects, we expect them to be most pronounced in the most demanding caregiving situation, skipped generation households. We also expect that caregiving will have stronger health effects for grandmothers than for grandfathers, given typical gender differences in other household responsibilities and the types of care provided by mothers and fathers.

DATA, MEASURES AND METHODS

Data

Our data come from Waves 4 to 6 (1998-2002) of the Health and Retirement Study (HRS), a nationally representative, longitudinal study of persons over age 50. The HRS is composed of four birth cohorts who entered the study in different calendar years; in 2002, it included 18, 167

respondents. Once they have entered the study, respondents are interviewed every two years.

The sample for each cohort was derived from the same stratified, multistage area probability design in which Blacks, Hispanics, and Floridians were over sampled. Initial cohort response rates ranged from 70 percent to over 80 percent; re-interview rates for all cohorts at each wave have been between 92 and 95 percent (Health and Retirement Study, 2004). We use data from age-eligible members of all four cohorts. Together, they form a nationally representative sample of the U.S. population age 50 and over in 1998, the first year in which they were all interviewed.

Our analytic sample is composed of 14,752 white, black and Hispanic grandparents born between 1918 and 1947. Of these, 1,880 (13%) provided no data about grandchild care; thus our final sample size is 12,872. Models allowing for sample selection bias due to missing data showed similar results to those presented here. The large sample size is a key strength of our study because caring for grandchildren coresidentially is still relatively rare (Pebley & Rudkin, 1999).

A limitation of our sample is that grandparents under age 50 are not represented. According to Census 2000, 28% of coresident grandparents are under age 50 (Simmons & Dye, 2003). The proportion of grandparents providing babysitting who are under age 50 is unknown. This limitation of our study should be kept in mind. However, any health effects of grandchild care are likely to be most evident in the 50s and 60s, a key turning point in health and aging.

Measure of Grandchild Care

In each wave, HRS respondents were asked whether they spent 100 or more hours taking care of grandchildren in the previous two years. Respondents answering 'yes' were asked how many hours they spent on grandchild care. Respondents also listed the people living in their household and their relationship to each person. Using this information, we identified grandchild care status for each respondent at each interview. We distinguished three kinds of care:

personally caring for at least one nonresident grandchild for 100 or more hours in the last two years, that is, approximately 50 hours a year (babysitting); living with at least one adult child and one or more grandchildren (multi-generation household); and living with one or more grandchildren with no adult child present (skipped-generation household). We further distinguished nonresidential caregivers by hours of care per year: 50-99 hours, 100-199 hours, 200-499 hours and 500 or more hours, since prior research suggests that only high levels of babysitting affect grandparents' health (Minkler & Fuller-Thomson 2001). Note that grandparents providing less than 50 hours of care a year are considered noncaregivers. Although we do not expect such low levels of care to affect health, this limitation should be borne in mind.

Table 1 shows the weighted proportion of respondents providing each type of grandchild care in 1998, the first year we observe respondents. Fifty-nine percent of grandmothers and 65% of grandfathers provided no care (i.e. less than 50 hours a year) for grandchildren over the preceding two years. Twenty-nine percent of grandmothers and 22% of grandfathers provided at least 50 hours of care a year for grandchildren they did not live with. About half these caregivers provided between 50-199 hours of care; however, nearly 7% of grandmothers and 3% of grandfathers provided 500 or more hours of care a year. Seven percent of grandmothers and 5% of grandfathers lived with grandchildren. Most of these households included three generations—the grandparent, an adult child and at least one grandchild. Less than 3% of grandparents lived with grandchildren in skipped-generation households.

We observe most respondents three times at two-year intervals. Thus they contribute two intervals of observation (i.e. 1998-2000, 2000-2002). In Table 2, we treat these intervals as the unit of observation and examine the weighted distribution of two-year stability and change in grandchild care. We see that in over half of the intervals, grandparents provided no care for grandchildren; they were not caregiving at both the beginning and the end of the two-year

interval. About 10% of grandmothers and grandfathers began some kind of care across the two-year intervals; most provided babysitting. Twenty-one percent of grandmothers and 14% of grandfathers continued some kind of care, again, primarily babysitting and 12% of grandmothers and 11% of grandfathers ended their caregiving responsibilities. About 1% of grandparents provided more care (i.e. moved from babysitting to multi-generational or skipped-generation household or from a multi-generational to skipped-generation household); similarly, about 1% reduced their caregiving (i.e., moved from a skipped-generation to a multi-generational household or babysitting or from a multi-generational household to babysitting).

Health Measures

Smoking. We measure whether respondents are current smokers. Models using the number of cigarettes as the outcome, with non-smokers coded to 0, showed substantively similar results to those presented here. The distribution of all health measures are shown in Table 1.

Problem drinking. We tested several measures of alcohol use: drinks per day (0, 1-2, 3-4 and 5 or more), drinks per week (0-topcode of 42), and problem drinking (5 or more drinks a week for women and 13 or more drinks a week for men). The results for these measures were nearly identical; we present results for problem drinking.

Exercise. This variable indicates whether the respondent participated in vigorous physical activity or exercise (such as sports, heavy housework, or a job that involves physical labor) three times a week or more on average over the previous 12 months.

Obesity. Body Mass Index (BMI) is calculated by dividing weight in kilograms by height in meters squared. We tested both a continuous measure and a dichotomous measure of obesity (BMI \geq 30). Again, results were very similar; we present results for the dichotomous measure.

Depressive symptoms. Each wave of the HRS includes a short version of the Center for Epidemiological Studies Depression Scale designed for telephone interviews with older

respondents (Turvey, Wallace, & Herzog, 1999). Each item asks whether the person experienced a specific symptom in the last week. Number of depressive symptoms is a count of affirmative responses, with two items tapping positive affect reverse coded; it ranges from 0 to 8.

Self-rated health. Each respondent was asked to rate his or her health on a five-point scale from poor to excellent, providing a subjective assessment of his or her health status.

Chronic conditions. In each wave, respondents were asked if a doctor had ever told them that they had diabetes, heart disease, lung disease, cancer, hypertension, or a stroke. Number of chronic conditions is the total number of conditions reported; it ranges from 0 to 6.

Functional limitations. Number of functional limitations is calculated by summing responses to twelve items assessing whether the respondent has difficulty with specific forms of ambulation, such as walking a block and climbing a flight of stairs, or muscle movements, such as moving a large chair or picking up a dime. It ranges from 0 to 12.

Covariates

We control for age (in years), gender, race/ethnicity (white, black and Hispanic), education (in years), log of household income and log of net worth. We also control for the respondent's contemporaneous roles—marital status, number of children under 18 in the household (besides any grandchildren) and whether the respondent is working full-time, part-time or not working. Most nonworking men are retired (82.1%); among women, 50.9% are retired and 34.8% are homemakers. Less than 2% of nonworking grandparents are unemployed.

Models and Methods

The unit of observation in our analysis is the two-year interval between pairs of interviews. We regressed each health measure at Time 2 (i.e. the interview ending the interval) on our 12-category measure of stability and change in grandchild care over the interval for men and women separately. Model I includes only our measure of grandchild care. Model II adds demographic

characteristics, contemporaneous roles and the year in which the interval started. Model III adds the corresponding health behavior or health outcome measured at Time 1 (i.e. the interview beginning the interval). We estimated a comparable series of models using a measure of grandchild care dividing babysitters by the number of hours of care per year (50-200, 200-499 and 500+) and divided the “more care” and “less care” categories into more/less babysitting and more/less other care. The results of these models were consistent with our overall conclusion; we note the few differences between these results and those we present.

Because each respondent may contribute two intervals to the data set, the observations are not independent and standard regression techniques are inappropriate. We thus estimated our models using Generalized Estimating Equations (GEE), which adjust the standard errors of the parameter estimates to account for non-independence by using the observed correlational structure of the data and which are appropriate for transition data (Diggle, Heagerty, Liang, & Zeger, 2002; Liang & Zeger, 1986).

Although the models for each health outcome include the same variables, the functional form varies by the metric of the outcome. For depression, self-rated health, chronic conditions and functional limitations we used OLS regression. We tested a negative binomial specification for depressive symptoms, chronic conditions and functional limitations; we also tested an ordered logit specification for self-rated health. The results were substantively the same to those we present. Smoking, alcohol consumption, exercise, and BMI are dichotomous, so we use a logistic regression specification. We present models that employ sampling weights; the substantive conclusions from unweighted models were the same.

RESULTS

Tables 3 and 4 display coefficients from Models I-III for each health outcome and health behavior for women. In Table 3, we see consistent support for our expectations. For every health outcome, Model I shows differentials between grandmothers providing various types of care and grandmothers who do not provide care. These differences attenuate or disappear with the introduction of covariates and Time 1 health in Models II and III respectively. Although the pattern is somewhat less consistent in Table 4, in general, we see that differences in health behavior by type of grandchild care observed in Model I attenuate or disappear in Models II and III. Analogous sets of models dividing babysitters by hours of care provided (not shown) showed the same pattern for both health and health behavior.

We also find support for our expectation that any net association between grandchild care and subsequent health would be evident among grandmothers living in skipped generation households. Four of the eight significant coefficients in Model III are for grandmothers living in skipped generation households. Grandmothers whose grandchildren move in show declines in self-rated health, but those continuing with this arrangement see a modest improvement, suggesting the negative effect of starting this kind of caregiving disappears as the arrangement continues. Grandmothers whose grandchildren move out have developed more functional limitations. Grandmothers who begin custodial care show large increases in depression and obesity and grandmothers who continue custodial care show large declines in exercise, although all of these relationships are only marginally significant ($<.10$).

Tables 3 and 4 also provide unexpected evidence that babysitting grandchildren improves health. Grandmothers who start babysitting grandchildren or who continue to provide this care report better self-rated health two years later than grandmothers who provide no care. In models separating babysitters by hours of care (not shown), we found that grandmothers who begin

providing 200-500 hours of care per year are more likely to exercise and report fewer functional limitations and grandmothers continuing this level of care report a decline in depressive symptoms. Grandmothers who continue to provide less than 200 hours of care or increase their hours of care are also more likely to exercise.

Tables 5 and 6 present coefficients from Models I-III for each health outcome and health behavior for men. Overall, for both health and health behavior, we see fewer differentials between grandfather caregivers and grandfathers not providing care in Model I than we did for grandmothers. However, again, the differences that do emerge nearly all disappear or attenuate in Models II and III. The remaining associations between grandchild care and health are few and scattered and do not form a consistent pattern.

Even in the large HRS sample, some categories of grandchild care contain few respondents, which may reduce our ability to detect changes in health and health behavior. Analysis of the confidence intervals surrounding the non-significant coefficients showed that, for most coefficients, our null results do not reflect insufficient power. However, we found that some of the non-significant confidence intervals in the health behavior models contained substantively important values. These were concentrated in the skipped generation, more care and less care categories and were typically of medium effect size (Cohen 1992), except for those in the alcohol problems models, which were large. We thus caution that the health behavior results for these categories should be considered tentative.

The coefficients and significance tests in Tables 3 to 6 compare grandparents providing each type of care to grandparents providing no care. We also compared grandparents who started, continued or stopped each kind of care to grandparents starting, continuing or stopping the other two kinds of care. The few significant coefficients among grandmothers reflect the results described above. We saw no significant differences among grandfathers.

DISCUSSION

We find no evidence that caring for grandchildren has dramatic and widespread negative effects on grandparents' health and health behavior. Our results provide some support for our expectation that grandmothers caring for grandchildren in skipped-generation households experience health declines. We see scattered evidence that grandmothers who babysit grandchildren experience health benefits.

Our findings suggest that many health deficits found by earlier studies among coresidential grandparent caregivers reflect these grandparents' characteristics and prior health, not consequences of caregiving. In bivariate models, grandparents providing coresidential care showed poorer health and health behavior. Controlling for sociodemographic characteristics, contemporaneous roles and prior health status attenuated these differences. Although such grandparents are at an initial health disadvantage, caring for grandchildren does not seem to make them worse.

These results also suggest that health declines are not an inevitable consequence of grandchild care. Many studies that find deteriorating health among caregiving grandparents focus on custodial grandparents in highly stressful circumstances. Since we detect few health effects in our nationally representative data, it seems that these experiences are in the minority. Our findings are consistent with the idea that the effects of grandchild care on grandparents' health are contingent on the context and circumstances of that care. For most grandparents, the demands of grandchild care appear to be balanced by the benefits of caregiving and available resources. Only when demands are heavy and resources scarce will grandchild care itself lead to health declines. The health deteriorations we observe among grandmothers beginning skipped generation households support this interpretation. These results also dovetail with findings from the three longitudinal, nationally representative studies of the effects of grandchild care on

mental health (Blustein et al., 2004; Minkler et al., 1997; Szinovacz et al., 1999).

Our findings are informative about the causes of health change in mid and later life. Although social relationships are considered beneficial for health, family relationships, especially those involving caregiving, may not always be salubrious (Hughes & Waite, 2002). Child welfare agencies are increasingly relying on family members, especially grandparents, to care for children when birth parents are unable to do so (Grinstead et al., 2003) and Table 1 shows that a relatively large proportion of grandparents provide babysitting to their grandchildren (see also Fuller-Thomson & Minkler, 2001). With this backdrop, our finding that grandchild care does not necessarily lead to health declines is noteworthy.

However, we temper this population-level view with the recognition that for a minority of grandparents, caring for a grandchild in a coresidential situation may compromise health. Moreover, these grandparents may begin caregiving in poorer health than other grandparents. Both issues raise concerns not only about grandparents' well being, but about the quality of childcare and grandparents' ability to maintain it. These situations lower profile in nationally representative data does not mean we should be sanguine about the health of older adults caring for grandchildren. Instead, our findings should stimulate research and policy to identify and assist those most at risk.

Although our study has many advantages over previous studies, it also has limitations. First, over a quarter of grandparents who live with grandchildren are younger than the HRS respondents. The HRS age restriction introduces an ambiguous bias. Younger grandparents are at a lower risk for health problems, however, we suspect that they are also more likely to be disadvantaged, exacerbating the demands of grandchild care, and more likely to have responsibilities (such as paid work) conflicting with grandchild care.

Second, our measure of grandchild care is imperfect and may render health effects of

grandchild care more difficult to detect. The time referents for the babysitting and coresidential categories are not precisely aligned; the babysitting category refers to two-year periods and the coresidential category is derived from cross-sectional snapshots. We do not know if the hours of babysitting were bunched together or spread out over the interval, we are unable to control for the duration of care and our “no caregiving” category includes grandparents providing very low levels of care. Our use of household structure as a proxy for caregiving may have inadvertently included situations in which grandchildren are actually caring for a frail grandparent and, more generally, does not take into account the potential advantages of multigenerational households. We were also unable to determine whether the adult child in a multigenerational household was the grandchild’s parent and to control for the age of the grandchild.

Third, even in the large HRS sample, the small number of caregivers in some categories reduced our ability to detect modest changes in health behavior. As we noted, the null results for these behaviors need to be interpreted with caution.

Despite these limitations, our results provide a broad perspective on the impact of grandchild care on grandparents’ health. In the introduction, we argued that negative health effects of grandchild care are contingent on the context and circumstances of caregiving, the benefits of caregiving, and the balance between caregiving demands and available resources. Our results suggest substantial heterogeneity on these dimensions and the need to understand their patterning and health effects.

One priority is to examine the factors placing grandparents at risk of grandchild care. Our analyses show that many of the health disadvantages among caregiving grandparents pre-date the onset of care. Rather than explaining away a social problem, these results indicate the need to examine the larger social processes creating and sustaining disadvantage. As Minkler & Fuller-Thomson (2005) argue, grandchild care is the outcome of intersecting systems of racial, class

and gender stratification. Similarly, Strawbridge and colleagues (1997) point out that grandchild care is not an isolated event, but one event in the grandparent's unfolding life course.

A second priority is to investigate how contexts and resources moderate the relationship between grandchild care and health. In our analysis, we were only able to examine differences by type and level of grandchild care and gender. Race/ethnicity is a potentially powerful moderator. Blacks and Hispanics are more likely to live in extended family households than non-Hispanic Whites. Although the literature debates whether these differences reflect distinct cultures, economic need or higher likelihoods that family members require assistance, in such contexts coresidential grandchild care may have different meanings and thus different health consequences. Race/ethnicity overlaps with a second key moderator, socioeconomic status. Minorities, especially Blacks, are more likely to be impoverished and to live in distressed communities, with correspondingly fewer resources and more difficult environments for raising children. As argued above, the circumstances surrounding the onset of care and the age and needs of the child are likely to significantly affect the likelihood of health change.

Such research will ultimately require new data collection. Although targeted samples of caregiving grandparents provide valuable insights, only nationally representative data can systematically compare grandparents in different situations. Currently, large national data sets such as the HRS do not collect detailed information about caregiving and the low prevalence of some situations means that they are present in small numbers. These limitations suggest the need for a representative study of grandparents that oversamples grandparent caregivers and collects detailed information about caregiving. Such data will enable the next generation of research on grandparent caregivers to identify grandparents at greatest risk.

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REFERENCES

- Blustein, J., Chan, S., & Guanais, F. C. (2004). Elevated Depressive Symptoms among caregiving Grandparents. *Health Services Research, 39*(6 (Part 1)), 1671-1689.
- Bowers, B. F., & Myers, B. J. (1999). Grandmothers Providing Care for Grandchildren: Consequences of Various Levels of Caregiving. *Family Relations, 48*(3), 303-311.
- Burton, L. M. (1992). Black Grandparents Rearing Children of Drug-Addicted Parents: Stressors, Outcomes, and Social Service Needs. *The Gerontologist, 32*(6), 744-751.
- Caputo, R. K. (2001). Depression and health among grandmothers co-residing with grandchildren in two cohorts of women. *Families in Society, 82*(5), 473-483.
- Cohen, J. (1992). A Power Primer. *Psychological Bulletin, 112*(1), 155-159.
- Diggle, P. J., Heagerty, P., Liang, K.-Y., & Zeger, S. L. (2002). *Analysis of Longitudinal Data*. Oxford: Oxford University Press.
- Eggebeen, D. J., & Hogan, D. P. (1990). Giving Between Generations in American Families. *Human Nature, 1*, 211-232.
- Fuller-Thomson, E. F., & Minkler, M. (2000). The mental and physical health characteristics of grandmothers who are raising their grandchildren. *Journal of Mental Health and Aging, 6*, 311-323.
- Fuller-Thomson, E., & Minkler, M. (2001). American grandparents providing extensive child care to their grandchildren: Prevalence and profile. *The Gerontologist, 41*(2), 201-209.
- Giarrusso, R., Feng, D., Wang, Q.-w., & Silverstein, M. (1996). Parenting and Co-parenting of Grandchildren: Effects on Grandparents' Well-being and Family Solidarity. *The International Journal of Sociology and Social Policy, 16*(12), 124-156.
- Goodman, C., & Silverstein, M. (2002). Grandmothers Raising Grandchildren: Family Structure and Well-Being in Culturally Diverse Families. *The Gerontologist, 42*, 676-689.

- Grinstead, L. N., Leder, S., Jensen, S., & Bond, L. (2003). Review of Research on the Health of Caregiving Grandparents. *Journal of Advanced Nursing*, 44(3), 318-326.
- Health and Retirement Study. (2004). Sample Size and Response Rates. Retrieved 22 April 2004, from http://hrsonline.isr.umich.edu/intro/sho_uinfo.php?hfyle=sample&xtyp=2
- Hofferth, S. (1996). Child care in the United States today. *The Future of Children: Financing Child Care*(6), 41-61.
- Hughes, M. E., & Waite, L. J. (2002). Health in Household Context: Living Arrangements and Health in Late Middle Age. *Journal of Health and Social Behavior*, 43, 1-21.
- Jendrek, M. P. (1993). Grandparents who parent their grandchildren: effects on lifestyle. *Journal of Marriage and the Family*, 55, 609-621.
- Kelley, S. J., Yorker, B. C., & Whitley, D. (1997). To grandmother's house we go and stay: Children raised in intergenerational families. *Journal of Gerontological Nursing*, 23, 12-20.
- Lee, S., Colditz, G., Berkman, L., & Kawachi, I. (2003). Caregiving to Children and Grandchildren and Risk of Coronary Heart Disease in Women. *American Journal of Public Health*, 93(11), 1939-1944.
- Liang, K.-Y., & Zeger, S. L. (1986). Longitudinal Data Analysis Using Generalized Linear Models. *Biometrika*, 73, 13-22.
- Lugaila, T. (1998). *Marital Status and Living Arrangements*. Washington, DC: United States Census Bureau.
- Minkler, M., & Fuller-Thomson, E. (2005). African American Grandparents Raising Grandchildren: A National Study Using the Census 2000 American Community Survey. *Journal of Gerontology :Social Sciences*, 60B, S82-S92.
- Minkler, M., & Fuller-Thomson, E. (2001). Physical and mental health status of American

- grandparents providing extensive child care to their grandchildren. *Journal of the American Medical Women's Association*, 56(4), 199-205.
- Minkler, M. (1999). Intergenerational Households Headed by Grandparents: Contexts, Realities, and Implications for Policy. *Journal of Aging Studies*, 13(2), 199-209.
- Minkler, M., & Fuller-Thomson, E. (1999). The Health of Grandparents Raising Grandchildren: Results of a National Study. *American Journal of Public Health*, 89, 1384-1389.
- Minkler, M., Fuller-Thomson, E., Miller, D., & Driver, D. (1997). Depression in Grandparents Raising Grandchildren: Results of a National Longitudinal Study. *Archives of Family Medicine*, 6(5), 445-452.
- Minkler, M., & Roe, K. M. (1996). Grandparents as Surrogate Parents. *Generations*(Spring), 34-38.
- Musil, C. M. (1998). Health, stress, coping and social support among grandmother caregivers. *Health Care for Women International*, 19, 441-455.
- Musil, C. M., & Ahmad, M. (2002). Health of grandmothers: A comparison by caregiver status. *Journal of Aging and Health*, 14(96-121).
- Pebley, A. R., & Rudkin, L. L. (1999). Grandparents Caring for Grandchildren: What Do We Know? *Journal of Family Issues*, 20(2), 218-242.
- Pruchno, R. A. (1999). Raising grandchildren: The experiences of black and white grandmothers. *The Gerontologist*, 39, 209-221.
- Pruchno, R. A., & McKenney, D. (2002). Psychological Well-Being of Black and White Grandmothers Raising Grandchildren: Examination of a Two-Factor Model. *Journals of Gerontology*, 57B, P444-P452.
- Roe, K. M., Minkler, M., Saunders, F., & Thomson, G. E. (1996). Health of Grandmothers Raising Children of the Crack Cocaine Epidemic. *Medical Care*(34), 1072-1084.

- Rossi, A. S., & Rossi, P. H. (1990). *Of Human Bonding: Parent-Child Relations Across the Life course*. New York: Aldine de Gruyter.
- Sands, R. G., & Goldberg-Glen, R. S. (2000). Factors associated with stress among grandparents raising their grandchildren. *Family Relations, 49*, 97-105.
- Simmons, T., & Dye, J. L. (2003). *Grandparents Living with Grandchildren: 2000*. Washington, D.C.: United States Census Bureau.
- Soldo, B. J., & Hill, M. S. (1993). Intergenerational Transfers: Economic, Demographic, and Social Perspectives. *Annual Review of Gerontology and Geriatrics, 138*, 187-216.
- Solomon, J., & Marx, J. (1999). Who cares? Grandparent/grandchild households. *Journal of Women and Aging, 11*, 3-25.
- Strawbridge, W. M., Walhagen, M. I., Shema, S. J., & Kaplan, G. A. (1997). New burdens or more of the same? Comparing adult grandparent, spouse and adult-child caregivers. *The Gerontologist, 37*, 505-510.
- Szinovacz, M. E., DeViney, S., & Atkinson, M. P. (1999). Effects of Surrogate Parenting on Grandparents' Well-Being. *Journal of Gerontology :Social Sciences, 54B*, S376-S388.
- Turvey, C. L., Wallace, R. B., & Herzog, R. (1999). A Revised CES-D Measure of Depressive Symptoms and a DSM-Based Measure of Major Depressive Episodes in the Elderly. *International Journal of Psychogeriatrics, 11(2)*, 139-148.
- Waldrop, D. P., & Weber, J. A. (2001). From grandparent to caregiver: The stress and satisfaction of raising grandchildren. *Families in Society, 82*, 461-472.
- Weber, J. A., & Waldrop, D. P. (2000). Grandparents raising grandchildren: families in transition. *Journal of Gerontological Social Work, 33*, 29-46.

Table 1: Measures of Care for Grandchildren, Health, and Covariates, Grandparents Ages 50-80, 1998 Health and Retirement Study (N= 12,872)

Characteristic	Women (N=7,416)		Men (N=5,456)	
	Mean or Percent	SD	Mean or Percent	SD
Grandchild Care Status				
Not a grandparent in 1998 ^a	4.6		7.6	
Grandparent, not providing care ^b	59.1		65.3	
Grandparent, providing care	29.4		22.1	
50-99 hours a year	6.8		7.6	
100-199 hours a year	10.2		7.7	
200-499 hours a year	5.6		3.9	
500+ hours a year	6.7		2.9	
Multi-generation household	5.3		3.9	
Skipped-generation household	1.7		1.2	
Smoker	17.4		19.1	
Problem drinker	9.5		10.9	
Exercises vigorously ≥ 3 Times/Week	42.8		53.3	
Obese	24.9		24.8	
Number of depressive symptoms (0-8)	1.67	1.98	1.23	1.71
Self-rated health (1-5)	3.19	1.14	3.24	1.14
Number of chronic conditions (0-6)	0.96	1.02	1.03	1.00
Number of functional Limitations (0-12)	2.62	3.01	1.72	2.50
Black	10.0		7.9	
Hispanic	6.6		6.6	
Age	63.63	8.50	63.29	8.26
Married	62.6		84.7	
Number of children under 18 in household	.04	.24	0.09	.40
Years of education	12.10	2.84	12.40	3.25
Household income (\$1000)	47.05	77.15	64.73	169.76
Household net worth (\$1000)	318.52	1194.87	373.66	1337.54
Working part-time	10.6		9.6	
Not working	62.1		47.1	

Note: Data are weighted to represent the U.S. population. Respondents not interviewed in 1998 are excluded.

^a These respondents had become grandparents by the 2002 interview.

^b "No care" includes grandparents who spent less than 50 hours a year personally caring for grandchildren.

**Table 2: Stability and Change in Grandchild Care Over Two Year Intervals,
Grandparents Ages 50-80, 1998-2002 Health and Retirement Study**

	Women	Men
Grandchild Care Status ^a		
No care both waves	53.7	60.7
Start babysitting	9.0	9.8
Continue babysitting	17.0	11.6
Stop babysitting	11.4	10.9
Start multi-generation household	0.6	0.8
Continue multi-generation household	3.6	2.4
Stop multi-generation household	0.8	0.8
Start skipped-generation household	0.2	0.2
Continue skipped-generation household	0.9	0.6
Stop skipped-generation household	0.3	0.3
More care	1.3	1.0
Less care	1.2	1.0

Note: Figures are weighted percentages. Based on pooled two-year interval data, 13,876 intervals for Women and 10,012 for men.

^a People who became grandparents during the interval are included

Table 3: Coefficients from Regressions of Health Measures on Grandchild Care Status and Change, Covariates and Prior Health, 1998-2002 Health and Retirement Study, Women

	Depressive Symptoms			Self-Rated Health			Chronic Conditions			Functional Limitations		
	I	II	III	I	II	III	I	II	III	I	II	III
Grandchild Care Status												
Grandparent, no care ^a	--	--	--	--	--	--	--	--	--	--	--	--
Start babysitting	-0.14*	-0.10	-0.04	0.16**	0.08**	0.06*	-0.11**	-0.01	-0.01	-0.39**	-0.20*	-0.10
Continue babysitting	-0.22**	-0.13*	-0.08	0.24**	0.12**	0.05*	-0.17**	-0.04	-0.01	-0.49**	-0.24**	-0.08
Stop babysitting	-0.07	-0.04	0.03	0.10**	0.05	0.01	-0.07**	-0.00	0.01	-0.21*	-0.09	-0.04
Start multi-generation household	0.43*	0.16	0.02	-0.01	0.07	0.09	-0.09	-0.00	-0.02	0.10	0.17	0.09
Continue multi-generation household	0.54**	0.13	0.07	-0.27**	-0.06	0.00	-0.09	-0.06	0.00	0.69**	0.41	0.15
Stop multi-generation household	0.41	0.10	-0.09	-0.27**	-0.12	-0.07	-0.06	-0.06	0.04	1.10**	0.94**	0.48
Start skipped-generation household	1.47**	1.16**	0.62	-0.81**	-0.65**	-0.45**	0.29*	0.32*	0.18	0.67*	0.25	-0.27
Continue skipped-generation household	0.77**	0.30	0.03	-0.14	0.11	0.12*	0.07	0.09	0.01	0.75*	0.34	-0.05
Stop skipped-generation household	0.74*	0.44	-0.08	-0.27**	-0.12	0.05	0.27**	0.26**	0.24**	0.92*	0.64	0.34
More care	0.37*	0.11	0.08	-0.07	0.05	-0.00	-0.07	-0.01	0.04	0.40	0.19	0.17
Less care	0.11	-0.08	0.08	-0.04	0.03	-0.07	-0.12*	-0.05	-0.05	0.20	0.17	-0.05
Black ^b		0.09	-0.10		-0.28**	-0.07**		0.29**	-0.00		0.28	-0.10
Hispanic ^b		0.14	-0.06		-0.18**	-0.06*		-0.20**	-0.01		-0.19	-0.08
Age		-0.01**	-0.01**		-0.00**	-0.00*		0.02**	0.00**		0.03**	0.01**
Married ^c		-0.19**	-0.03		0.06*	0.04*		-0.08**	-0.03*		-0.15	-0.01
Number of children < age 18 in household		-0.13	-0.06		0.02	0.01		-0.02	0.03		-0.19	-0.03
Education		-0.12**	-0.04**		0.08**	0.02**		-0.05**	-0.00		-0.17**	-0.02*
Household income (log)		-0.07**	-0.06**		0.05**	0.02**		-0.01	-0.01		-0.09**	-0.03
Household net worth (log)		-0.06**	-0.03**		0.04**	0.01**		-0.02**	-0.00		-0.11**	-0.04**
Working part-time ^d		0.09	0.05		-0.09*	-0.03		-0.01	-0.01		0.08	0.00
Not working ^d		0.38**	0.18**		-0.31**	-0.10**		0.09**	0.02		0.73**	0.13*
Interval began in 2000 ^e		0.03	0.01		-0.06**	-0.10**		0.11**	0.04**		0.19**	0.07
Depressive symptoms			0.61**									
Self-rated health					0.72**							
Chronic conditions								0.93**				
Functional limitations												0.84**
Constant	1.70**	5.35**	2.48**	3.15**	1.78**	0.55**	1.20**	0.35*	0.12	3.04**	5.04**	1.07**
Observations	13036	13036	13036	13756	13756	13756	13724	13724	13724	8850	8850	8850
Unique ID's	7077	7077	7077	7384	7384	7384	7374	7374	7374	5287	5287	5287
χ^2	74.04	623.00	4893.03	133.00	1765.20	18785.90	71.41	1265.78	46021.47	73.98	643.89	17498.81
df	11	22	23	11	22	23	11	22	23	11	22	23

Note: Ordinary least squares regression models. Unit of analysis is two-year interval between interviews. Models estimated with GEE procedures; analyses performed using sampling weights.

^a "No care" includes grandparents who personally spent less than 50 hours a year caring for grandchildren.

^b Reference category is non-Hispanic white. ^c Reference category is not married. ^d Reference category is working full-time. ^e Reference category is interval began in 1998.

* $p < .05$, ** $p < .01$

Table 4: Coefficients from Regressions of Health Behavior on Grandchild Care Status and Change, Covariates and Prior Health, 1998-2002 Health and Retirement Study, Women

	Smoking			Problem Drinking			Exercise			Obesity		
	I	II	III	I	II	III	I	II	III	I	II	III
Grandchild Care Status												
Grandparent, no care ^a	--	--	--	--	--	--	--	--	--	--	--	--
Start babysitting	0.04	-0.10	0.00	-0.10	-0.16	-0.07	0.29**	0.17*	0.16	0.15**	0.07	0.02
Continue babysitting	0.07	-0.10	-0.15	0.03	-0.10	0.05	0.42**	0.26**	0.16*	0.21**	0.11	0.08
Stop babysitting	0.11	0.02	0.24	-0.09	-0.15	-0.04	0.18**	0.09	-0.02	0.16**	0.09	0.10
Start multi-generation household	0.39**	0.18	-0.23	-1.52**	-1.39**	-1.84	0.18	0.20	0.08	0.70**	0.49*	1.42**
Continue multi-generation household	0.34*	0.03	-0.12	-1.02**	-0.67*	0.06	-0.31*	-0.18	-0.22	0.74**	0.41**	0.43*
Stop multi-generation household	0.55**	0.36	0.63	-0.77	-0.49	-0.46	0.04	0.18	0.10	0.44**	0.22	-0.27
Start skipped-generation household	-0.44	-0.62	-1.04	-0.37	0.16	0.32	-0.24	-0.07	-0.22	0.61	0.37	1.37
Continue skipped-generation household	0.47*	0.20	0.66*	-0.89	-0.35	0.47	-0.66**	-0.48*	-0.41	0.72**	0.34	0.50
Stop skipped-generation household	-0.06	-0.14	-0.16	-0.55	-0.24	0.02	-0.15	0.02	-0.06	0.22	0.01	0.11
More care	0.45**	0.22	0.90	-1.08**	-1.05*	-1.36	-0.17	-0.14	-0.22	0.57**	0.30**	0.27
Less care	0.47**	0.27	0.52	-1.85*	-1.80	-0.71	-0.25	-0.23	-0.23	0.55**	0.32*	0.00
Black ^b		-0.46**	-0.34		-0.93**	-0.37		-0.05	0.02		0.65**	0.10
Hispanic ^b		-1.14**	-0.38		-0.52	-0.40		0.11	0.13		-0.03	-0.17
Age		-0.07**	-0.03**		-0.01	-0.00		-0.01**	-0.01**		-0.04**	-0.04**
Married ^c		-0.46**	-0.04		0.14	0.05		0.10	0.07		-0.09	-0.15
Number of children < age 18 in household		-0.15	0.11		-0.31	-0.24		0.12	0.12		0.06	-0.13
Education		-0.10**	-0.04		0.17**	0.07**		0.06**	0.05**		-0.05**	-0.01
Household income (log)		-0.02	0.03		0.13*	0.15		0.04	0.04		-0.01	0.01
Household net worth (log)		-0.04**	-0.04		0.06*	0.02		0.07**	0.06**		-0.01	-0.01
Working part-time ^d		-0.07	-0.19		0.00	0.14		0.19*	0.20*		0.16*	0.01
Not working ^d		-0.03	-0.01		-0.04	0.10		-0.10	-0.05		0.19**	0.07
Interval began in 2000 ^e		-0.02	0.12		0.12**	0.66**		-0.11**	-0.08		0.11**	0.20
Smoking			6.17**									
Problem drinking						4.77**						
Exercise									1.97**			
Obesity												5.45**
Constant	-1.80**	4.85**	-1.98*	-2.28**	-6.12**	-6.46**	-0.56**	-1.64**	-2.33**	-1.20**	2.39**	-0.75
Observations	13763	13763	13763	13724	13724	13724	13752	13752	13752	13706	13706	13706
Unique ID's	7388	7388	7388	7376	7376	7376	7385	7385	7385	7369	7369	7369
χ^2	33.72	320.01	3035.37	54.25	209.30	2347.29	86.54	352.33	2024.49	74.59	340.51	4163.83
df	11	22	23	11	22	23	11	22	23	11	22	23

Note: Logistic regression models. Unit of analysis is two-year interval between interviews. Models estimated with GEE procedures; analyses performed using sampling weights.

^a "No care" includes grandparents who personally spent less than 50 hours a year caring for grandchildren.

^b Reference category is non-Hispanic white. ^c Reference category is not married. ^d Reference category is working full-time. ^e Reference category is interval began in 1998.

* $p < .05$, ** $p < .01$

Table 5: Coefficients from Regressions of Health Measures on Grandchild Care Status and Change, Covariates and Prior Health, 1998-2002 Health and Retirement Study, Men

	Depressive Symptoms			Self-Rated Health			Chronic Conditions			Functional Limitations		
	I	II	III	I	II	III	I	II	III	I	II	III
Grandchild Care Status												
Grandparent, no care ^a	--	--	--	--	--	--	--	--	--	--	--	--
Start babysitting	-0.05	0.03	0.04	0.16**	0.07	0.02	-0.08**	0.00	0.02	-0.11	0.04	0.02
Continue babysitting	-0.03	0.09	0.10*	0.11**	0.02	-0.01	-0.07*	0.01	0.02	-0.03	0.07	0.10
Stop babysitting	-0.02	0.06	0.10	0.08*	0.03	0.01	-0.05*	-0.01	0.00	0.02	0.09	-0.01
Start multi-generation household	0.15	-0.01	-0.05	-0.16	-0.12	0.09	0.01	0.10	0.02	0.33	0.41	-0.11
Continue multi-generation household	0.42**	0.26	0.20	-0.12	-0.02	0.01	0.01	0.09	0.03	0.50	0.44	0.39**
Stop multi-generation household	0.45	0.27	0.26	-0.21*	-0.10	-0.05	0.06	0.10	0.02	0.49	0.41	-0.18
Start skipped-generation household	0.63	0.51	0.72	-0.31	-0.27	-0.02	0.12	0.24	0.07	1.34	1.37	0.66
Continue skipped-generation household	0.28	0.23	-0.07	-0.22	-0.11	-0.05	-0.05	0.02	-0.05	1.09**	0.91*	0.24
Stop skipped-generation household	0.41	0.32	0.12	-0.32*	-0.21	-0.14	0.16	0.15	0.13	0.30	0.17	-0.61
More care	-0.02	-0.08	-0.22	-0.17	-0.12	0.01	0.07	0.14	0.00	0.47	0.46	0.21
Less care	0.31	0.34	0.23	-0.11	-0.15	-0.14	-0.00	0.10	0.08	0.59*	0.71**	0.27
Black ^b		0.08	0.00		-0.14**	-0.03		0.09	0.02		0.05	-0.00
Hispanic ^b		0.08	-0.08		-0.02	-0.04		-0.26**	-0.08**		-0.84**	-0.16
Age		-0.01	0.00		-0.01**	-0.00**		0.03**	0.00**		0.01	0.02**
Married ^c		-0.42**	-0.13*		0.05	0.05		-0.05	0.00		0.03	0.00
Number of children < age 18 in household		0.11	0.01		0.01	-0.03		0.01	-0.00		-0.04	0.05
Education		-0.08**	-0.04**		0.07**	0.02**		-0.02**	-0.01*		-0.13**	-0.02**
Household income (log)		-0.04	-0.01		0.02*	0.00		-0.01	0.01		-0.10**	-0.01
Household net worth (log)		-0.05**	-0.02*		0.03**	0.01*		-0.01**	-0.00		-0.10**	-0.02**
Working part-time ^d		-0.02	-0.02		-0.12**	-0.03		0.09*	0.05*		0.26**	-0.02
Not working ^d			0.22**		0.05			0.16**	0.03*		0.82**	0.09
Interval began in 2000 ^e		-0.05	-0.06		-0.06**	-0.09**		0.12**	0.04**		0.22**	0.05
Depressive symptoms			0.59**									
Self-rated health						0.67**						
Chronic conditions									0.93**			
Functional limitations												0.82**
Constant	1.18**	3.80**	1.27**	3.19**	2.43**	0.97**	1.28**	-0.09	-0.08	1.99**	4.52**	-0.10
Observations	8241	8241	8241	9982	9982	9982	9964	9964	9964	7734	7734	7734
Unique ID's	4616	4616	4616	5448	5448	5448	5441	5441	5441	4496	4496	4496
χ^2	16.20	361.52	2028.32	34.82	940.82	9017.61	20.82	825.34	31656.63	19.87	502.61	7263.41
df	11	22	23	11	22	23	11	22	23	11	22	23

Note: Ordinary least squares regression models. Unit of analysis is two-year interval between interviews. Models estimated with GEE procedures; analyses performed using sampling weights.

^a "No care" includes grandparents who personally spent less than 50 hours a year caring for grandchildren.

^b Reference category is non-Hispanic white. ^c Reference category is not married. ^d Reference category is working full-time. ^e Reference category is interval began in 1998.

* $p < .05$, ** $p < .01$

Table 6: Coefficients from Regressions of Health Behaviors on Grandchild Care Status and Change, Covariates and Prior Health, 1998-2002 Health and Retirement Study, Men

	Smoking			Problem Drinking			Exercise			Obesity		
	I	II	III	I	II	III	I	II	III	I	II	III
Grandchild Care Status												
Grandparent, no care ^a	--	--	--	--	--	--	--	--	--	--	--	--
Start babysitting	-0.10	-0.18*	0.01	-0.24	-0.29*	-0.20	0.29**	0.18*	0.20*	0.17*	0.08	0.06
Continue babysitting	-0.14	-0.19*	-0.07	-0.18	-0.22	0.04	0.23**	0.12	0.06	0.30**	0.20*	0.17
Stop babysitting	-0.02	-0.06	-0.01	0.06	0.03	0.28	0.11	0.04	0.00	0.08	0.01	-0.01
Start multi-generation household	0.07	-0.11	-0.32	0.16	0.35	0.20	0.34	0.40	0.75*	0.13	0.02	-0.91
Continue multi-generation household	0.43*	0.23	0.28	-0.30	-0.22	-0.13	-0.07	0.00	0.04	0.20	0.07	0.23
Stop multi-generation household	-0.11	-0.24	-0.71	-0.30	-0.21	-0.90	0.00	0.10	-0.05	-0.10	-0.19	-0.41
Start skipped-generation household	0.01	-0.28	1.02	0.32	0.49	1.23	0.00	0.02	0.33	-0.80	-0.95	0.10
Continue skipped-generation household	0.15	-0.04	0.75	-0.59	-0.47	0.01	-0.27	-0.23	0.03	-0.03	-0.19	-0.08
Stop skipped-generation household	0.15	0.07	0.42	-0.73	-0.63	-0.50	-0.73	-0.67	-0.61	0.46	0.38	0.50
More care	0.16	0.02	0.54	0.31	0.33	0.44	-0.16	-0.17	-0.16	0.11	-0.05	-0.83
Less care	0.17	0.04	0.45	-0.22	-0.22	0.27	-0.29	-0.40	-0.52	0.14	-0.00	0.21
Black ^b		0.15	-0.23		-0.67**	-0.22		-0.06	-0.00		-0.01	-0.00
Hispanic ^b		-0.33*	-0.06		0.09	0.05		0.03	-0.03		-0.26	-0.15
Age		-0.07**	-0.04**		-0.02*	-0.02*		-0.01**	-0.01*		-0.05**	-0.04**
Married ^c		-0.34**	-0.11		-0.19	-0.31		0.17*	0.11		0.33**	0.08
Number of children < age 18 in household		0.02	-0.10		-0.40*	-0.31		-0.02	-0.01		0.00	-0.09
Education		-0.09**	-0.02		0.05**	0.05*		0.03**	0.02*		-0.04**	-0.02
Household income (log)		-0.01	0.01		-0.01	-0.05		0.04	0.03		0.02	0.01
Household net worth (log)		-0.02*	-0.02		0.02	0.04		0.06**	0.05**		-0.02	-0.02
Working part-time ^d		-0.01	0.26		-0.07	-0.02		0.02	0.07		0.25**	0.29
Not working ^d		0.15*	0.31		-0.12	0.04		-0.31**	-0.22**		0.11	-0.05
Interval began in 2000 ^e		0.01	0.32		0.13*	0.57**		-0.06	-0.01		0.10**	0.13
Smoking			6.09**									
Problem drinking					4.34**							
Exercise									2.13**			
Obesity												5.18**
Constant	-1.59**	4.66**	-1.29	-2.22**	-1.87**	-2.71**	-0.07*	-0.87*	-1.68**	-1.14**	2.43**	-0.43
Observations	9985	9985	9985	9907	9907	9907	9983	9983	9983	9980	9980	9980
Unique ID's	5449	5449	5449	5420	5420	5420	5450	5450	5450	5448	5448	5448
χ^2	16.73	235.14	2203.31	13.80	67.16	1690.02	29.46	224.41	1672.34	24.26	167.12	2909.22
df	11	22	23	11	22	23	11	22	23	11	22	23

Note: Logistic regression models. Unit of analysis is two-year interval between interviews. Models estimated with GEE procedures; analyses performed using sampling weights.

^a "No care" includes grandparents who personally spent less than 50 hours a year caring for grandchildren.

^b Reference category is non-Hispanic white. ^c Reference category is not married. ^d Reference category is working full-time. ^e Reference category is interval began in 1998.

* $p < .05$, ** $p < .01$