

Health in Household Context: Living Arrangements and Health in Late Middle Age*

MARY ELIZABETH HUGHES

Duke University

LINDA J. WAITE

National Opinion Research Center & University of Chicago

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People living in some arrangements show better health than persons in other living arrangements. Recent prospective studies document higher mortality among persons living in particular types of households. We extend this research by examining the influence of household structure on health using longitudinal data. We theorize that individuals experience role-based household relations as sets of resources and demands. In certain household structures, individuals are more likely to perceive that the demands made on them outweigh the resources available to them. This perceived imbalance poses a risk to individual health. We test our expectations by analyzing the relationship between living arrangements and health using data from waves 1 and 2 of the Health and Retirement Study. We focus on persons ages 51–61 and explore gender differences. We find prospective links between household structure and self-rated health, mobility limitation, and depressive symptoms. Married couples living alone or with children only are the most advantaged; single women living with children appear disadvantaged on all health outcomes. Men and women in other household types are disadvantaged on some health outcomes. Our results suggest that the social context formed by the household may be important to the social etiology of health. In addition, they qualify the well-known link between marital status and health: The effect of marital status on health depends on household context.

In June 2000 the Human Genome Project completed a preliminary map of human genetic structure. To many observers, this remarkable achievement heralded a new era of gene-

based understanding of health and illness. Yet the same week that researchers at the National Institutes of Health presented the genomic sketch, the Institutes held a major conference highlighting evidence that health depends on socially-generated environments and experiences that transcend individual biology. Clearly, deciphering human genetic code is not sufficient for understanding health and illness. Progress on biological substrates of disease needs to go hand in hand with similar progress by social scientists on the social etiology of health and illness.

A critical challenge for social scientists is to specify how social environments place individuals “at risk of risks” (Link and Phelan 1995). Thus, an increasing body of research has focused on the health implications of spatial environments such as neighborhoods or cities

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(e.g., Robert 1998; Waitzman and Smith 1998). In contrast, little research has considered the most immediate social context in which individuals are embedded: the family (Rogers, Hummer, and Nam 2000). However, the social environment formed by the family, especially the co-residential family or household, may be particularly salient to health. The household is an important locus of social roles and social relations; individuals encounter this environment on a daily basis.

We address this important gap by examining physical and emotional health among adults in various types of households. First, we develop a theoretical perspective linking families, households, and health. Next, we examine the prospective influence of household structure on health, by gender, in a nationally representative sample. Our analysis focuses on the age range 51–61. Understanding the health consequences of household structure in this age group is especially important. Health problems in these years lower the likelihood of remaining healthy and functional for the entire life span—a critical concern in an aging society.

PREVIOUS RESEARCH

An extensive literature shows that both social integration (the structural dimension of social relations) and social support (the sustaining content of social relations) positively influence health (Berkman and Glass 2000; House, Umberson, and Landis 1988; Seeman 1996; Thoits 1995). A separate literature considers the health impact of incumbency in social roles such as parent, spouse, caregiver, or worker, both alone and in various combinations (e.g. Adelman 1994; Moen, Dempster-McClain, and Williams 1992; Pavalko and Woodbury 2000; Waldron, Weiss, and Hughes 1998). Although these literatures provide insight into the potential links between household structure and health, neither focuses explicitly on the social environment formed by the household.

A long tradition of research does show the health benefits of the most prominent dimension of households: the presence of a spouse. Being married—which in the United States nearly always implies co-residence—has consistently positive effects on physical health that do not reflect selection into marriage (Lillard and Waite 1995; Goldman, Korenman, and

Weinstein 1995; Umberson 1992; Waite and Hughes 1999). The emotional benefits of marriage, while also positive, are found less consistently (Horwitz, White, and Howell-White 1996; Marks and Lambert 1998; Umberson et al. 1996). Marriage benefits health because married-couple households have more economic resources than other households (Lupton and Smith forthcoming) and because marriage brings monitoring of health, social support for healthy behaviors, emotional intimacy, and social attachment (Ross 1995; Umberson 1992; Waite and Gallagher 2000).

Most research on marital status and health contrasts persons in all types of unmarried households with persons in married-couple households. Similarly, most analyses do not distinguish *among* married-couple households, failing to differentiate, for instance, couples who live alone, with children, or with others. Thus, this research does not tap the full complexity of contemporary household structure (Rogers et al. 2000; Hughes and Waite forthcoming). The limited body of research that has examined links between household structure and health has produced mixed results.

For example, three prospective studies investigate the relationship between household structure and mortality. Although all three studies find differences across household types in the risk of dying, their specific findings are inconsistent. Lillard and Waite (1995) find that unmarried women living with children experience higher mortality than comparable married women and that married men living with adults besides the wife experience a very small protection against death. In contrast, Rogers (1996) finds that married persons living with others, previously-married persons living alone, and previously married persons living with others experience higher mortality. Finally, Rogers, Hummer, and Nam (2000) find that, compared with married couples living with two children, the unmarried living alone are 58 percent more likely to die. Unmarried adults living with one child face risks of dying identical to unmarried adults living alone, but single parents' chances of dying increase substantially with increasing numbers of children. Single adults who are not household heads and live with others and adult children living with their married parents also face increased risks of dying compared to married parents.

A handful of disconnected studies examines

the association between household structure and health in cross-section. Overall, most find significant relationships between living arrangements and health, although the possibility that the relationships are actually due to the influence of health on living arrangements cannot be ruled out. Hughes and Gove (1981) find that unmarried persons living alone are in no worse mental health than unmarried persons living with others and are in better mental health on some measures. Gove, Hughes, and Galle (1979) find that household crowding diminishes mental and physical health. Denton and Walters (1999) also find that single women have a mental health advantage. In contrast, Dean et al. (1992) find that persons aged fifty and above living alone are more likely to be depressed than persons not living alone. Similarly, Waite and Hughes (1999) find that living alone disadvantages individuals on a range of health measures, Macran, Clarke, and Joshi (1996) find that women living alone have lower functional health, and Denton and Walters (1999) find that men living alone have poorer functional health.

The evidence for an association between single parenthood and health is more consistent. A review concludes that children do not benefit, and sometimes harm, the health of their parents (Ross, Mirowsky, and Goldstein 1990). Single parents are at a health disadvantage in multiple studies of different nations (Angel and Angel 1993; Benzeval 1998; Denton and Walters 1999; Waite and Hughes 1999; Whitehead et al. 2000). However, Macran et al. (1996) find that although single parents are disadvantaged with respect to mental health, they are advantaged on other measures of health. Usually, these studies do not consider who else is in the household, for example, whether the parent and children are living with other relatives.

We know even less about the reasons that household structure might influence health. Several authors suggest that disparities in socioeconomic resources among different types of households might underlie household-based health differentials (Angel and Angel 1993; Rogers et al. 2000). However, controlling for economic disadvantage does not fully explain the health deficits experienced by single parents or by persons in other types of households (Benzeval 1998; Waite and Hughes 1999). Others suggest that structural context disadvantages members of some types of

households. However, a comparative analysis of Sweden and Great Britain found that lone parents were disadvantaged in both countries, despite better social and cultural support for lone parents in Sweden (Whitehead et al. 2000). Although other pathways have been proposed, none have been tested (Angel and Angel 1993; Benzeval 1998; Hughes and Gove 1981; Minkler and Fuller-Thomson 1999; Rogers et al. 2000).

THEORETICAL PERSPECTIVE

The household—by which we mean household composition or the number and identity of household members—provides social integration and social support for household members. Household membership brings social ties; like any social tie, these link individuals to others and to social structure. Household-based social ties in turn bring instrumental, informational, and emotional supports from others, as would any social tie.

However, household social relations are distinct from other social relations in four important ways. First, since 69 percent of households are family households and 79 percent of adults live with other family members (Casper and Bryson 1998; Lugala, 1998), household relations are usually invested with the powerful norms, histories, and emotions that characterize family relationships. Relations within families are multidimensional; family solidarity develops through affect, exchange, value consensus, norms, structure, and association (Bengtson, Rosenthal, and Burton 1990). Family relations are also variable in quality; of all social relations, family relations are most likely to be negative and damaging to individual well-being (Antonucci and Akiyama 1995; Burg and Seeman 1994).

Second, household interactions are structured by household-based social roles, most of which are also family roles, such as child, spouse, or parent. The expectations and obligations associated with family roles are relatively well-defined, at least compared to the social roles embedded in other social relations, such as friendships or co-workers. These expectations and obligations shift over the life course. For example, the role of parent to a teenager differs from the role the same parent will play when the child is in his or her thirties. Similarly, roles are gendered, so that the

parental role differs for men and women. Finally, role entitlements and responsibilities vary according to the structure of the household in which the role is enacted. Thus, an adult daughter living with her parents faces a different situation than if she were living alone or with her child.

Third, household members are linked by the household economy comprising market work, home production, and consumption (Burch and Matthews 1987). To varying degrees, household members contribute time, labor, and income to the domestic economy; economic exchanges are in many respects the foundation of the household. The household economy connects individuals to the larger economy and is an important conduit through which macrosocial forces affect individuals.

Finally, the routine and repetitive nature of within-household exchanges highlights the reciprocal nature of social relations. Social relations are transactional in that individuals typically both give and receive support. Although the receipt of support is presumably beneficial, providing support may entail costs. Most analyses of social support focus on the receipt or availability of support to an ego. When analyzing all social exchanges, including those that are infrequent and spread out over time, this perspective is useful. However, within the household reciprocity is more obvious and potentially more salient to individual well-being.

From day to day, household members participate in many forms of interaction and exchange. Members of households typically share meals and other domestic services, like cleaning and laundry. Household members provide each other routine assistance and personal care. Within-household relations may bring companionship, comfort, and intimacy; or distance, aggravation, and conflict; or all of these at different times.

We theorize that individuals experience these tangible and intangible relations as sets of resources and demands. Resources and demands are conceptual tools summarizing within-household dynamics from the perspective of a particular household member. Although household interactions and exchanges are reciprocal, for a particular individual a given interaction may impose demands or provide resources. For example, household members both give and receive emotional support. Although receiving support

presumably brings benefits, giving support may entail costs. Similarly, domestic labor can be either a resource or a demand, depending on whether the individual is providing the labor or enjoying its results.

We further theorize that it is an individual's perception of the *balance* of resources and demands that is consequential for his or her health. Many demands without corresponding resources may lead to poorer health through pathways similar to those linked to lack of social support (cf. Gove and Hughes 1979). That is, the perception that demands exceed resources can lead to poor health behaviors, negatively affect psychological well-being, and activate the stress response, all of which may eventually damage health (Berkman and Glass 2000; Seeman and McEwen 1996; Thoits 1995; Uchino, Cacioppo, and Kiecolt-Glaser 1996). In contrast, when resources equal or exceed demands household relations may benefit or protect health.

Overall, the greater imbalance in role expectations and obligations in a dyadic relationship, the greater the potential for imbalance in experienced demands and resources. For example, the unique nature of the marital bond means that the spousal relationship is typically characterized by a greater degree of balance than the relationship between parent and child or between grandparent and grandchild (Waite and Gallagher 2000). Household members are more likely to share resources with others in the household the more closely related they are, so spouses and children have more claim than more distant relatives or non-relatives (Rossi and Rossi 1990). All else equal, a dyadic relationship in which one member needs extra instrumental or emotional support will increase demands and reduce the resources available to the other person. For example, young co-resident grandchildren bring very different demands and resources than older grandchildren living in another household with their parents.

Thus, we argue, households with different structures make very different demands on the adults in them and offer very different resources. If so, we should also see patterned differences in health among persons living in various types of households. Because the expectations of household-based roles vary over the life course, these patterns will differ by age. Similarly, because women and men experience different expectations and obliga-

tions in their family roles and so experience different demands and resources, we expect that the consequences of household structure will vary by gender, with women experiencing both greater burdens and greater benefits from family relationships than men (Logan and Spitze 1996).

RESEARCH QUESTION

We extend previous research by using longitudinal data to assess whether persons living in different types of households experience systematically different patterns of health. Earlier studies examine broad age ranges, potentially obscuring the link between households and health. We focus on a narrow and relatively understudied age group: late middle age (ages 51–61).

In these years, individuals are well established and are often providing support to others. This support may take the form of offering co-residence to adult children, to grandchildren, or to a parent (Aquilino 1990; Ward, Logan, and Spitze 1992). Often, this coresidence is due to crises or difficulties in the other person's life. Thus, persons in this age group exhibit a surprising variety of household structures (Siegel 1993; Waite and Hughes 1999). Understanding the health implications of household structure for individuals on the threshold of old age is critical. Although most adults in this age group are healthy and function at high levels, a substantial fraction is beginning to show signs of health impairment (Waite and Hughes 1999). Such early impairments greatly increase the risk of disability in old age.

We examine health in three dimensions: self-reported health, mobility limitations, and symptoms of depression. Examining several health dimensions in the same study is important because social factors may affect various dimensions of health with different strengths or in different time frames (Seeman 1996; Thoits 1995).

Following our theoretical emphasis on the qualitative differences in resources and demands among households of different structures, we compare health among persons living in six types of households: married persons living only with their spouse, married persons living with children, married persons living with others, single persons living alone, single

persons living with children, and single persons living with others. In addition to examining the effects of household structure on health, this approach allows us to determine whether the effects of marital status on health depend on household context.

We examine the relationship between an individual's household structure and his or her health two years later. This temporal separation of living arrangements from the assessment of health substantially reduces the impact of health on choice of or changes in household structure and increases our confidence that our results reflect the *impact* of the household environment on health. Although our principal focus is on the effects of household structure on health status, we also speculate about the impact of household structure on health change.

The consistent finding that married persons experience better health leads us to expect that married persons living alone will show the best health. Rogers et al.'s (2000) finding that married couples living with their own children do not face higher mortality than married couples without children suggests to us that the presence of children constitutes a manageable demand for married couples and will not negatively affect their health. However, based on the cross-sectional studies described above, we anticipate that single adults living with their own children will show poorer health than otherwise similar married parents with children. Evidently, co-resident children, even adult children, generate more demands relative to resources for a single parent.

Although persons living alone have no demands placed on them by others within the household, they have no one living with them to provide resources. Following Hughes and Gove (1981), we thus expect that single persons living alone will show poorer health than otherwise similar married persons, but better health than single persons living with others.

Persons in multi-generational households, we argue, will experience the worst health. Research suggests that custody of grandchildren negatively affects grandparents' health (Minkler and Fuller-Thomson 1999). Rogers et al. (2000) point out that larger families increase the opportunities to both give and receive social, emotional, instrumental, and financial support, but also bring additional emotional stress and financial strain. Gove et al. (1979) suggest that household crowding has

detrimental effects on health, in part due to increased social demands. We thus argue that for members of this age group the additional demands will outweigh the additional benefits. Although we expect this effect for both married and single persons, we expect single persons to fare worse, since they lack a spouse's support.

Living arrangements may have different implications for the health of men and women due to gender differences in the impact of an imbalance in household resources and demands. Since women are much more likely than men to be responsible for providing physical and emotional care to others in the household, and because responsibility for the care of others may interfere with women's ability to care for themselves (Gove and Hughes 1979), demanding households may take a larger toll on women than on men. In addition, some scholars suggest that women react more strongly than men to stress (Kessler and McLeod 1984), exacerbating the effect of demanding households on women. These arguments lead us to expect that women will show larger negative health effects of living in complex households and living alone with children, but not in living alone.

ANALYTIC STRATEGY

We perform a series of analyses for each health dimension. We begin by establishing the relationship between living arrangement and health two years later, adjusting for the presence of long term and chronic health conditions at baseline. The temporal separation of our independent and dependent variables, combined with controls for pre-existing health problems, reduces the possibility of reverse causation. Model 1 for each health dimension presents these results.

Characteristics such as age, race/ethnicity, and education are causally prior to living arrangements and related to both living arrangements and health. For instance, black adults have lower levels of functioning, on average, than white adults (Schoenbaum and Waidman 1997) and are also more likely to live in complex families (U.S. Bureau of the Census 1996). Hispanic older adults are substantially more likely than others to live with relatives (Burr and Mutchler 1993) and live in households with more people, on average (U.S.

Bureau of the Census 1996), although they function as well as or better than whites. Education has a well-known positive relationship with health (Ross and Wu 1995). Some of the observed relationship between living arrangements and health may be due to the influence of these causally prior variables on both. In Model 2, we introduce controls for age, race/ethnicity, and education.

Household income, work status, and presence of relatives in the neighborhood are likely to be related both to living arrangements and to health. In Model 3 for each health outcome we include control variables for these circumstances measured at baseline. However, in our two-period model the causal ordering between living arrangement and each of these variables is unclear. Because of this ambiguity, interpreting the results of Model 3 is difficult. On the one hand, the results may show the true effect of living arrangements, controlling for all relevant variables. On the other hand, these variables might represent pathways through which living arrangements influence health. For example, if people form a household to pool income in the face of economic need, the higher level of household income may protect their health.

Our interpretation of Model 3 falls closer to the latter perspective. We view the influence of living arrangements in this model as showing the extent to which household social environment influences health. In other words, any residual effect that remains after the introduction of these control variables is, we argue, due to the content and quality of household interactions and exchanges. It follows that the results of Model 2 represent an upper bound to the entire effect of living arrangements.

Models 1–3 reflect the core of our analysis. In Model 4, we extend the analysis one step further to speculate about the effects of household structure on health change. For each health dimension, we include the corresponding indicator measured at baseline. These models can be interpreted as reflecting differential change in health over a two-year period for those in various living arrangements initially. However, two caveats are in order. First, the measures of mobility limitation and depressive symptoms are different in waves 1 and 2, weakening the degree to which we may interpret these models as assessing change. Second, this type of analysis does not distinguish health declines and health improvements. Because

individuals at all levels of initial health are pooled in one model, poorer health at wave 2, net of health at wave 1, could be due either to a higher likelihood of health decline or a lower likelihood of health improvement. This strategy also does not differentiate persons with stable health, which may be high or low.

Although the corresponding models for each health outcome include the same variables, the functional form for each set varies according to the metric of the outcome variable. For self-rated health, an ordinal variable, we used an ordered logit specification. For mobility limitation, a dichotomy, we used logistic regression. For number of depressive symptoms, a count variable, we used a negative binomial specification. We run all models separately for men and women to explore possible gender differences in the effects of living arrangements on health.

DATA AND MEASURES

Data for this analysis are drawn from waves 1 and 2 of the Health and Retirement Study, a longitudinal survey of a nationally representative sample of the 1931–1941 birth cohorts. These cohorts were 51–61 in 1992.

The Health and Retirement Study sample was derived from a stratified, multistage area probability design in which blacks, Hispanics, and Floridians were over sampled. Baseline interviews with 12,654 respondents were completed in 1992. Besides interviews with age-eligible respondents, spouses of married respondents were interviewed regardless of their age. Since 1992, respondents have been re-interviewed at two-year intervals. At wave 2, 91.8 percent of persons interviewed at wave 1 were reinterviewed (Health and Retirement Study 2000).

Our analytic sample is restricted to the 9,540 age-eligible white, black and Hispanic respondents interviewed at wave 1.¹ Of these, we include respondents who were alive and interviewed at wave 2.² We then exclude the small minority of respondents for which information on either family structure or household finances was not available at wave 1. Our sample thus consists of 8,485 white, black, and Hispanic individuals age 51 to 61 at baseline (some age-eligible respondents had turned 62 by the interview).

We account for the complex sampling

design of the Health and Retirement Study in our estimation. First, we use sampling weights to adjust for differential probabilities of selection into the sample. Second, we use the Huber-White variance estimator to allow for stratification and clustering and thus ensure that our standard errors are not inflated (Greene 1997).

Health Measures

In constructing the health measures, we followed Wallace and Herzog (1995). We present the distributions of these variables by gender in Table 1. The questionnaire items used to construct the variables are presented in the Appendix. All measures are coded so that higher values indicate *poorer* health.

Self-rated health. Self-rated health is designed to capture respondents' subjective assessment of their own medical and functional status. In both waves, respondents were asked to rate their health on a five-point scale from excellent to poor.

Mobility limitation. Mobility limitation directly assesses the respondent's capacity for physical mobility and is thus a measure of physical functioning. It is calculated by summing responses to five items assessing whether the respondent has difficulty with specific forms of ambulation, such as walking a block and climbing a flight of stairs. For the purposes of this analysis, we dichotomized the measure into no difficulty and difficulty on at least one item. However, we also estimated models with the number of limitations as the dependent variable; in general these showed similar results.

Although the same items were asked in each wave to assess mobility difficulty, the stem of the questions differed between the two waves. The distributions in Table 1 show a notable decline in reported difficulty between the two waves. It thus appears likely that the mode of asking the questions in the second wave elicited fewer reports of difficulty. We expect that this measurement effect will bias our effects to zero. To the extent that we expect downward health transitions, the spurious improvements in mobility act as a conservative bias in Model 4.

Data for mobility limitation are missing for 3 and 4 percent of respondents at waves 1 and 2 respectively. Missing values on the mobility

TABLE 1. Summary Statistics for Health Measures, Living Arrangements and Covariates, By Gender, Health and Retirement Study, 1992 and 1994 (Female N = 4,581; Male N = 3,904)^a

Measure	Female Mean or Percent	Male Mean or Percent
Self-Rated Health, 1992 ^b		
Excellent	23.5	24.7
Very Good	30.9	29.9
Good	25.3	27.8
Fair	13.4	11.3
Poor	6.8	6.5
Self Rated Health, 1994		
Excellent	18.7	20.5
Very Good	31.3	30.9
Good	28.6	28.8
Fair	14.6	13.2
Poor	6.8	6.6
Mobility Limitation, 1992 ^c	58.2	38.9
Mobility Limitation, 1994 ^c	42.6	26.7
Depressive Symptoms Index, 1992 (1-4)	1.5	1.4
Number of Depressive Symptoms, 1994 (0-8) ^c	1.4	1.1
Number of Chronic Conditions, 1992 (0-6)	.8	.8
Long Term Disability, 1992	2.3	2.7
Living Arrangement ^d		
Married, Alone	39.8	41.0
Married, Children	21.5	34.2
Married, Others	7.4	8.1
Single, Alone	14.7	10.1
Single, Children	7.8	2.2
Single, Others	8.8	4.4
Age	55.6	55.6
Race/Ethnicity		
White	83.8	85.8
Black	10.6	8.7
Hispanic	5.7	5.5
Years of Education	12.2	12.6
Household Income (\$1000)	47.3	59.4
Working	60.2	79.0
Family Members in Neighborhood	33.5	31.6

^a Sample includes white, black, and Hispanic age-eligible respondents interviewed at waves 1 and 2 with complete wave 1 financial and family information. Respondents who died between 1992 and 1994 (N = 164) are excluded. Figures are calculated using sampling weights and allowances for complex sample design.

^b For all health measures, higher values indicate worse health.

^c 3% or more of cases missing information.

^d Living arrangements and covariates are measured in 1992.

index are due primarily to responses that people "don't do" one or two components: walk several blocks and climb several sets of stairs. Analyses of these cases suggest that people "don't do" because they are unable to do, imparting a conservative bias to our analysis by excluding those with the most limitations.

Depressive symptoms. In wave 1, the Health and Retirement Study included a short version of the Center for Epidemiological Studies Depression Scale, which has been used extensively for respondents across a range of ages. The scale is designed to assess depressive symptoms. Each item on the scale is a question about how the respondent felt in the last week. For each item, respondents answered all or

almost all of the time, most of the time, some of the time, or none or almost none of the time. These responses were coded 1 to 4; the depressive symptoms index is the average of the eleven items, with two positive affect statements reverse coded (Wallace and Herzog 1995). In wave 2, a smaller subset of the items was asked. In addition, the form of the question was changed to read "Much of the time in the last week I felt . . ." with a response set of yes or no. The shortened form of the scale was designed for interviews with older respondents and has satisfactory psychometric properties (Turvey, Wallace, and Herzog 1999). Number of depressive symptoms is a count of the affirmative responses, again with the items tapping

positive affect reverse coded; it ranges from 0 to 8. 6 percent of cases are missing this item due to proxy interviews, which we expect to impart a conservative bias.

Presence of chronic conditions. In the first wave of the study, 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 the respondent reported; it ranges from 0 to 6.

Long term condition. This variable measures whether the respondent has a long term, disabling condition. It is based on questions about whether the respondent has a disability, the condition that caused it, and the date of onset.

Measures of Living Arrangements

We show the distribution of our respondents across living arrangements, by gender, in Table 1. Due to the rarity of cohabitation in these cohorts, we did not have enough cohabiting couples for separate analysis; the 240 cohabiting respondents are treated as married. We tested measures of household structure that accounted for ages of co-resident children but found no significant differences.

“Unmarried” refers to current status and includes all types of non-marriage: separated, widowed, divorced, and never married. The distribution of marital status among the unmarried varied by gender. Among women, half were separated or divorced, a third were widowed, and the remainder were never married. Among men, two-thirds were separated or divorced, a fifth were never married, and the remaining minority were widowed. We believe it is likely that the type of non-marriage is consequential to an individual’s well being, even if it does not have specific ramifications for household life. We were unable to control for “unmarried status” in our models due to collinearity. However, we did estimate our models including only the separated and divorced in the “single” categories. Not surprisingly, given that the divorced and separated are the majority of the unmarried among both genders, the results were quite similar to the models we will present. In fact, in some cases the negative effects of particular household structures were stronger, suggesting that persons in other types of non-marriage may have a different experience of these household

structures. This heterogeneity in marital histories should be kept in mind when interpreting our results.

Married couples or singles who are living with others may also be living with children; we constructed our measures to distinguish households in which the relationships were nuclear from those that are more complex. The vast majority of the others in these complicated households are lineal relatives another generation removed—for example the parents or grandchildren of the respondent. The category “single, others” includes a substantial fraction of persons who are living in another’s household. In the other categories nearly all households are headed by the respondent or the respondent’s spouse.

Measures of Covariates

Socio-demographic characteristics. The measures for socio-demographic characteristics that precede wave 1 living arrangement are straightforward. Age is measured in years within the 51 to 62 age range included in the Health and Retirement Study. Dummy variables indicate black and Hispanic race/ethnicity. Education is measured in years. The distributions of these covariates by gender are also shown in Table 1.

Contemporaneous circumstances. We include household income (in thousands of dollars) and a dummy variable measuring employment (full or part time, with not working as the reference group). Finally, we include an indicator variable for the presence of family in the neighborhood, besides those in the household. We show the distributions by gender in Table 1.

RESULTS

Self-Rated Health

Table 2 presents Models 1–4 for self-rated health, separately by gender. The figures in the Table are coefficients from ordered logistic regressions of self-rated health on sets of independent variables. Ordered logistic regression is appropriate for ordinal dependent variables; statistically, it is a generalization of logistic regression (Long 1997). The procedure estimates an underlying score as a linear function

TABLE 2. Coefficients from Ordered Logistic Regressions of 1994 Self-Rated Health^a on 1992 Living Arrangement, Health, and Covariates, By Gender, Health and Retirement Study

	Females				Males			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Living Arrangement ^b								
Married, Children	-.026	-.041	.046	.071	-.048	-.013	.069	.043
Married, Others	.519***	.213*	.308**	.231*	.345**	.117	.162	.131
Single, Alone	.293**	.243**	.214*	.155	.501***	.515***	.376**	.268
Single, Children	.575***	.379**	.397**	.290*	.397	.402	.403	.438*
Single, Others	.537***	.252*	.214	.123	.716***	.578**	.391	.261
Chronic Condition, 1992	.892***	.838***	.800***	.280***	.897***	.911***	.849***	.386***
Long Term Disability, 1992	1.458***	1.308***	1.084***	.301	1.051***	1.045***	.750***	.442*
Age		.002	-.008	-.006		.008	-.005	.002
Black ^c		.624***	.605***	.292**		.453***	.351***	.243*
Hispanic ^c		.783***	.788***	.507***		.414**	.353*	.461*
Years Education		-.191***	-.149***	-.091***		-.194***	-.166***	-.088***
Working			-.527***	-.190**			-.759***	-.302**
Household Income (\$1000)			-.005***	-.002***			-.004***	-.002**
Family Members in Neighborhood			.179**	.179**			.118	.044
Self-Rated Health, 1992			.201**	1.433***				1.331***
Cut points								
1	-.817	-3.174	-3.750	-.106	.728	-2.810	-4.046	.179
2	.818	-1.450	-1.991	2.153	.834	-1.139	-2.351	2.283
3	2.364	.227	.273	4.477	2.393	.567	-.600	4.554
4	3.905	1.896	-1.431	6.636	3.816	2.111	1.007	6.600
Unweighted N ^d	4,581	4,581	4,581	4,581	3,901	3,901	3,901	3,901
F	124	181	138	147	88	131	129	112
(df)	(7,55)	(11,51)	(14,48)	(15,47)	(7,55)	(11,51)	(14,48)	(15,47)

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

^a Higher values indicate worse self-rated health.

^b Reference category is married couples living alone.

^c Reference category is white.

^d Analyses are weighted and take into account the complex sampling design.

of independent variables and a set of cut points. The probability of observing an individual in a particular category corresponds to the probability that the score is within the range of the cut points estimated for that category. The coefficients in the Table represent the effect of a unit change in the associated independent variable on the score. Although the coefficients are not directly interpretable in terms of the original self-rated health scale, they can be used to judge direction, relative magnitude, and significance.

The first column of the first panel presents the results of Model 1 for females. We see that the relationship between living arrangement and self-rated health measured two years later, controlling for a chronic condition and long term disability at baseline, is quite strong. Women who were married and living with children in the first wave did not rate their health in the second wave any differently than those who were married and living alone with their spouse. In contrast, women in all of the other arrangements rated their health significantly lower. Analyses not displayed showed that the coefficients for "married, others," "single, children," and "single, others" were not significantly different from each other.³

Model 2 introduces the socio-demographic variables that precede the wave 1 living arrangement. Not surprisingly, including these variables attenuates the effects of living arrangements on self-rated health. Some of the effect of living arrangements on self-rated health among women is due to the association of living arrangements with race/ethnicity and education. However, the pattern remains. Married women living in complex households and single women living in any type of household rate their subsequent health lower than married women living only with a spouse, even controlling for age, gender, race/ethnicity, and education. Hypothesis testing of the coefficients revealed that the coefficients for these living arrangements were also statistically different from the coefficient for the "married, children" category. However, they did not significantly differ from each other.

The third column of the first panel shows the results of Model 3 for females. Model 3 includes control variables intended to adjust for life circumstances that may be endogenous to living arrangements. The results are similar to those found in Model 2, except that the effect of being single and living with others is

only marginally significant. Net of household income, employment status, and family members in the neighborhood, married women living with others, single women living alone, and single women living with children rate their health more poorly than women living only with their husband or with their husband and children. Analyses not shown demonstrate that the coefficients for "married, others," "single, alone," "single, children," and "single, others" are not statistically different. Note that the marital advantage to health apparently is not enjoyed by married women living in complex households.

Columns 1 through 3 of the second panel of Table 2 present the results of Models 1–3 for males. Similar to females, we see that men in certain living arrangements at wave 1 report poorer self-rated health at wave 2 compared to men living only with a spouse at wave 1, net of controls. In contrast to females, the negative effects of living arrangements on health appear only for single men living alone or living with others in Model 2. In Model 3 the effect of being single and living with others is reduced to non-significance. However, note that the magnitudes of the non-significant coefficients for "single, children" and "single, others" are relatively high; their non-significance may reflect the very few men that are to be found in these categories. We estimated corresponding models with interaction terms for gender by living arrangement; the results (not presented here) show no significant gender differences in the relationship between living arrangements and self-rated health.

The results in Table 2 suggest that living arrangements are prospectively related to self-rated health among both men and women. We are unable to gauge the precise nature of the gender differences, due to the small number of men in some of these arrangements. Our tentative conclusion is that, contrary to our expectation, there are few gender differences in the effects of household structure on self-rated health.

Although the effects of living arrangements on health observed in Model 1 are reduced with the introduction of controls for socio-demographic characteristics (Model 2), and current circumstances (Model 3), significant differences in self-rated health remain. As we argued previously, we view the coefficients from Model 2 as an upper bound to the effect of living arrangements on health. The model

controls for prior predictors of both health and living arrangements, but does not control for factors that may be pathways of influence between living arrangements and health. We expect that the effects of living arrangements still evident in Model 3 are due to the individual's experience of household-based demands and resources.

Model 4 for each gender suggests that living arrangements also affect change in health. When we control for self-rated health at wave 1, married women living with others and single women living with children rate their health poorer at wave 2. Single men living with children rate their health poorer net of their initial rating. Again, no gender differences in the impact of living arrangements appear in a model with interaction terms for gender by living arrangement.

Mobility Limitation

Table 3 presents coefficients from logistic regressions of respondents' reports of mobility limitations on the sets of independent variables, again by gender. The coefficients express the change in the log-odds of limitation associated with a one unit change in an independent variable.

The first panel presents the results for females. Again, in Model 1 we see a strong relationship between wave 1 living arrangement and the likelihood of having a mobility limitation at wave 2, controlling for health conditions at wave 1. For example, being single and living with children increases the odds of experiencing a mobility limitation by 58 percent ($e^{.458} - 1$). Women who are married or single and live with others also experience higher risks of mobility limitation two years later. Hypothesis testing of the coefficients shows that women living in married couple households with or without children and single women living alone experience significantly lower risks of mobility limitation than women in the other three arrangements.

The introduction of controls for wave 1 socio-demographic characteristics in Model 2 attenuates these effects, but for the most part they are still significant and fairly strong. Married women living with spouse or with spouse and children and single women living alone are the most advantaged with respect to physical mobility status. Women living in the

arrangements "married, others," "single, children," and "single, others" at wave 1 are more likely to be limited at wave 2.

Adding contemporaneous circumstances in Model 3 reduces the impact of being single and living with others to marginal significance, but *increases* the significant coefficients for being married and living with others and being single and living with children observed in Model 2. Additional analyses revealed that married women living in complex households have higher than average household income, most likely due to the greater number of people in the household, and single women living with children are more likely to be working. Both factors are positively related to health, so once they are introduced in Model 3, the relationship between these living arrangements and poorer health strengthens. Women in both arrangements continue to show mobility disadvantages compared with persons living in other arrangements in the presence of a multitude of controls. Again, the marital advantage to health is not enjoyed by those who are married and living with others.

The results for men, presented in the second panel of Table 3, can be summarized quite quickly. Living arrangements appear unrelated to mobility limitations among men. Women living in a married couple household with others or as a single parent are more likely than other women to have mobility limitations; however, men in similar households are not. Testing for gender differences in an interactive model shows no significant differences; however, the coefficients for the interaction between gender and "married, others" and "single, children" were negative and large, corresponding to the large differences between the coefficients in the female and male models. Once again, we suspect that the paucity of men in these arrangements prevents us from estimating gender differences precisely.

The final column of each panel presents the results of Model 4 for each gender. These results parallel the respective results in Model 3. Married women living with others and single women living with children are more likely to experience mobility limitations, even net of mobility status at wave 1; men's living arrangements are unrelated to mobility limitations. However, again, gender differences in the effect of living arrangements are not statistically significant.

TABLE 3. Coefficients from Logistic Regressions of 1994 Mobility Limitation^a on 1992 Living Arrangement, Health, and Covariates, By Gender, Health and Retirement Study

	Females				Males			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Living Arrangement ^b								
Married, Children	-.021	.006	.055	.128	-.153	-.134	-.043	.109
Married, Others	.505***	.403**	.468**	.441**	.314*	.159	.218	.078
Single, Alone	.113	.111	.113	.089	.306	.324	.138	.052
Single, Children	.458**	.433**	.463**	.554**	.043	.074	.028	-.008
Single, Others	.385**	.316*	.304	.268	.509*	.435	.188	.027
Chronic Condition, 1992	.752***	.704***	.669***	.540***	.770***	.770***	.695***	.474***
Long Term Disability, 1992	1.558***	1.468***	1.279***	1.103***	.812***	.810***	.467*	.159
Age	.023	.023	.016	.025*	.005	.005	-.012	.002
Black ^c	.029	.029	.014	-.084	-.084	-.120	-.263*	-.386**
Hispanic ^c	.025	.025	-.003	-.047	.201	.201	.126	.319
Years Education	-.133***	-.133***	-.103***	-.093***	-.148***	-.148***	-.121***	-.111***
Working			-.434***	-.305***			-.840***	-.670***
Household Income (\$1000)			-.003**	-.002			-.005**	-.004**
Family Members in Neighborhood			.107	.060			-.088	-.036
Mobility Limitation, 1992			1.421	2.044***				2.041***
Constant	1.759***	-.214	4.380	-.465	1.018***	-.602	-.202	-2.230***
Unweighted N ^d	4,380	4,380	4,380	4,236	3,759	3,759	3,759	3,668
F	62	67	53	114	52	33	31	54
(df)	(7,55)	(11,51)	(14,48)	(15,47)	(7,55)	(11,51)	(14,48)	(15,47)

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

^a Higher value indicates a limitation.

^b Reference category is married couples living alone.

^c Reference category is whites.

^d Analyses are weighted and take into account the complex sampling design.

Depressive Symptoms

Table 4 displays the results of negative binomial regressions of number of depressive symptoms on the sets of independent variables. Negative binomial regression is appropriate to model outcomes that represent counts. Count data are often modeled using Poisson regression, however negative binomial regression is used when the data show more variation than would be expected were they generated by a Poisson process (Long 1997). The figures in the table show the multiplicative change in the expected number of depressive symptoms for a one unit change in an independent variable.

Again, we begin by considering the results for females, presented in the first panel of Table 4. In the first column we see, as for the previous two measures, significant differences in depressive symptoms for those living in different types of households, net of baseline health conditions. Married women living with others report significantly more depressive symptoms (1.373 times the number, or 37% more) than do married women living only with their spouse. Single women living alone, with children, or with others are also relatively disadvantaged on this measure. Hypothesis testing showed that the coefficients for "married, others," "single, alone," and "single, others" were not significantly different; all of these coefficients differed significantly from "married, children." Single women living with children appear to fare worst of all with respect to depressive symptoms.

With the introduction of the socio-demographic variables in Model 2, the effect of being married and living in a complex household becomes only marginally significant. Women who are single, whether they live alone, with children, or with others still report significantly more depressive symptoms than their married counterparts. The differences between these effects are not statistically significant.

However, in Model 3 married living with others is once again significant, perhaps due to the introduction of a control for income, as discussed above. The pattern remains similar to the pattern observed in Model 1; married women living with their spouse only or their spouse and children fare the best, married or single women in complex households and

single women living alone fare worse and similarly, and single women living with children experience the most depressive symptoms.

The second panel of Table 4 presents the results of the depression models for men. In Model 1, we see that married men living with others and single men in any living arrangement report significantly higher number of depressive symptoms. However, with the introduction of controls in Models 2 and 3 the effect of being married and living in a complex household is reduced to non-significance. Single men living alone, with children, and with others all report higher numbers of depressive symptoms; the coefficients do not differ significantly from each other, but they do differ significantly from the coefficients for "married, children" and "married, others." In interactive models, we found that the coefficients for "single, alone" and "single, others" were significantly higher for men, although the introduction of the controls in Model 3 reduces the interaction of gender and "single, others" to insignificance. This is our strongest evidence for gender differences in the effects of living arrangements on health. Evidently living alone, and to some extent being single and living in a complex household, are more distressing to men than to women. Overall, the effect of living arrangements on depression among men appears to reflect the positive effect of marriage. However, this conclusion is tempered by the lack of a significant interaction between gender and "married, others" in the interactive models, suggesting that being married and living in a complex household may increase depressive symptomatology among men as well as among women.

The final column of each panel shows the results for Model 4 for men and women. Again, to the extent that these models reflect change, we see that living arrangements are related to health change. Single women living with children report significantly more depressive symptoms compared to other women, net of their initial level of depressive symptoms. Single men living alone or with others also report significantly more symptoms, net of initial levels. The interactive models show once again that single men living alone report higher levels of depressive symptomatology than women living alone.

TABLE 4. Coefficients from Negative Binomial Regressions of 1994 Depressive Symptoms^a on 1992 Living Arrangement, Health, and Covariates, By Gender, Health and Retirement Study

	Females				Males			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Living Arrangement ^b								
Married, Children	1.016	.979	1.039	1.035	1.112	1.100	1.132	1.076
Married, Others	1.373***	1.148	1.211**	1.165	1.434***	1.182	1.195	1.063
Single, Alone	1.384***	1.319***	1.278**	1.112	2.369***	2.290***	2.153***	1.470***
Single, Children	1.709***	1.514***	1.489***	1.266**	1.840***	1.850***	1.859***	1.359
Single, Others	1.514***	1.265**	1.228*	1.105	2.096***	1.838***	1.691***	1.468**
Chronic Condition, 1992	1.336***	1.273***	1.231***	1.136***	1.360***	1.361***	1.301***	1.164***
Long Term Disability, 1992	1.926***	1.838***	1.600***	1.150	1.893***	2.000***	1.735***	1.252
Age		.978**	.976**	.984*		.974**	.970***	.978*
Black ^c		1.256***	1.239***	1.227***		1.061	1.017	.970
Hispanic ^c		1.335***	1.306***	1.356***		1.457***	1.445***	1.203*
Years Education		.887***	.907***	.935***		.902***	.911***	.923***
Working			.759***	.852**			.740***	.999
Household Income (\$1000)			.997*	.998			.999	.924
Family Members in Neighborhood			1.014	1.013			.921	.924
Depression Index, 1992				3.137***				4.233***
Unweighted N ^d	4,480	4,480	4,480	4,480	3,462	3,462	3,462	3,462
Wald Chi Square	480	886	975	1266	330	450	495	862
(df)	(7)	(11)	(14)	(15)	(7)	(11)	(14)	(15)

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

^a Higher values indicate more symptoms of depression.

^b Reference category is married couples living alone.

^c Reference category is whites.

^d Analyses are weighted and take into account the complex sampling design.

DISCUSSION

In this paper we show that, among persons in their fifties, living arrangements in one year are significantly related to self-rated health, mobility limitations, and depressive symptoms two years later. Members of married couples living alone or with children only are the most advantaged with respect to health; single women living with children are disadvantaged on all health outcomes. People living in other types of households face a health disadvantage compared with persons living only with a spouse or spouse and children; the pattern varies by health outcome and gender.

Our results have five implications. First, the social context formed by the household appears to be important to the social etiology of health. Our findings extend previous research showing cross-sectional relationships between living arrangements and health and prospective relationships between living arrangements and mortality. The temporal separation of living arrangements from health outcomes in our analysis allows us to say with more certainty that health results from the household environment in which one lives, at least in part. We also explored the potential effects of household structure on health change by holding constant the corresponding health measures at baseline. This strategy allows us to interpret these models as measuring change in health or health trajectories. However, differences across survey years in the measurement of the health outcomes, a short follow-up period, and the inability to distinguish health declines from health improvements make us cautious in our claims of examining change. With these caveats, however, our results suggest that adults in certain living arrangements do face different prospects for health change.⁴

Second, the effects of living arrangements on health do not seem merely to reflect the well-established marital advantage to health. Persons who are married and live only with spouse or with spouse and children do show the best health on all measures. However, we see substantial variation in the extent to which persons in the other arrangements differ from persons in these two. Only when we examine depression among men do we see the effects of living arrangements apparently only mirroring the effect of marriage. Even then, this conclusion is tempered by the results of the interactive models which suggest that, similar to

women, men who are married and live with others experience more depressive symptoms than otherwise similar married men who live with spouse or children. Overall, our results suggest household structure is important beyond marital status—that in certain circumstances marriage does not protect health, that singlehood does not diminish health, and that gender differentiates these effects.

Third, following our theoretical perspective, our findings suggest that in late midlife persons living in particular household structures experience demands that exceed their coping resources and that this imbalance ultimately affects their health. These demands and resources emerge directly from the social environment formed by social roles and relations within the household. We propose that living in situations where demands exceed resources may increase the stress response, lead to poorer health behaviors, reduce the time available for self-care, and inhibit access to health care. Over time, we reason, these conditions increase the chances of illness and functional limitations and reduce the likelihood of health improvement.

Fourth, we found that the pattern of gender differences varied across the health outcomes. This finding contrasts with our expectation that the negative health effects of demanding and resource-poor households would be larger among women than among men. However, we must note that our ability to assess these gender differences was hampered by the relatively small number of men in certain arrangements, which we suspect meant that the effects were estimated with large standard errors. With this caveat, we tentatively conclude that there are no gender differences in the effects of living arrangements on self-rated health. In contrast, we suggest the effects of living arrangements on mobility limitations and depression do vary by gender. Single women living with children and married women living in complex households face a higher risk of mobility limitation, but men living in similar situations do not. Single men living alone or with others experience an even higher risk of depressive symptomatology than women in similar situations. Our findings contrast somewhat with Simon's (1998) results showing few differences in response to work and family stressors between male and female employed parents, with the few differences suggesting a greater vulnerability among men.

Fifth, the health outcomes we consider respond to living arrangements in different patterns and to different degrees. We expect that these differences reflect variations in the processes by which health conditions develop and abate, including variability in time frames. For example, self-rated health is a global self-assessment of one's health. Because it is a subjective assessment, it is likely to be most sensitive to household context, both through actual ill-health and feelings of tiredness, burden, and stress. In contrast, mobility limitations may reflect a longer-term process whereby excessive household demands increase the stress response, which over a long period of time may trigger or exacerbate chronic conditions. In turn, these demands limit time and attention devoted to managing the chronic condition, with consequent mobility limitations. The time frame for the development of depressive symptoms is likely to fall between these two. Examining these processes is clearly an important priority for future research.

We identified a prospective relationship between household composition and health. Although our expectations were based on how we anticipated social roles would structure household social relations, we did not explicitly examine the balance of demands and resources across household types. Unpacking the black box of the household is an important priority for future research. We expect that this

approach will show stronger relationships between household relations and health and, perhaps, sharper distinctions among household types than have studies to date. Our results document the average effect of each household type on health change. However, the qualities of relationships within households of the same structure certainly differ. In addition, similar to multiple demanding roles, structurally demanding households may damage health only under certain conditions, such as poverty. If racial and ethnic differences in household structure reflect cultural traditions that emphasize kin solidarity and intergenerational ties (Himes et al. 1996), we also might expect to see racial and ethnic differences in the ways various household structures affect health. Finally, a closer look at within household dynamics will begin to identify some more proximate pathways through which household demands and resources influence health, such as time use, stress, or stigma.

As the population of the United States ages, understanding the social etiology of chronic disease becomes increasingly critical. At the same time, the United States is facing a legacy of several decades of rapid family change. Our findings suggest that understanding the confluence of these trends—or how the family and household place people “at risk of risks” for ill health—will be an important challenge.

APPENDIX. Items Used To Construct Health Measures**Self-Rated Health**

"Would you say your health is excellent, very good, good, fair, or poor?"

1. Excellent
2. Very Good
3. Good
4. Fair
5. Poor

Mobility Limitation—Wave 1

"Please look at the answer categories at the top of page one of the booklet and tell me how difficult each activity is for you. Exclude any difficulties that you expect to last less than three months. How difficult is it for you to . . ."

- " . . . walk several blocks?"
 - " . . . walk one block?"
 - " . . . walk across a room?"
 - " . . . climb several flights of stairs without resting?"
 - " . . . climb one flight of stairs without resting?"
1. Not at all difficult
 2. A little difficult
 3. Somewhat difficult
 4. Very difficult/can't do
 5. Don't do

Mobility Limitation—Wave 2

"Please tell me how difficult each of the following activities is for you. Exclude any difficulties that you expect to last less than three months. Do you have any difficulty with . . .? (If yes) Is that a little or a lot of difficulty?"

- " . . . walking several blocks?"
 - " . . . walking one block?"
 - " . . . walking across the room?"
 - " . . . climbing several flights of stairs without resting?"
 - " . . . climbing one flight of stairs without resting?"
1. Yes—how much: a little
 2. Yes—how much: a lot
 3. Yes—how much: don't know/NA
 4. Yes—how much: refused
 5. No
 6. Don't do

Depression Index—Wave 1

"Please look at the top of page 2 of the booklet and tell me how often you have experienced the following feelings during the past week."

- "During the past week, I felt depressed."
 - "I felt that everything I did was an effort."
 - "My sleep was restless."
 - "I was happy."
 - "I felt lonely."
 - "I felt people were unfriendly."
 - "I enjoyed life."
 - "I felt sad."
 - "I felt people disliked me."
 - "I could not 'get going'."
 - "I did not feel like eating; my appetite was poor."
1. All of the time
 2. Most of the time
 3. Some of the time
 4. None or almost none of the time

Depression Index—Wave 2

"Now think about the past week and the feelings you have experienced. Please tell me if each of the following was true for you much of the time this past week. Much of the time during the past week . . ."

- "You felt depressed."
 - "Everything you did was an effort."
 - "Your sleep was restless."
 - "You could not 'get going'."
 - "You felt lonely."
 - "You enjoyed life."
 - "You felt sad."
 - "You were happy."
1. Yes
 5. No

Chronic Condition—Wave 1

- "Has a doctor ever told you . . ."
- " . . . that you have high blood pressure or hypertension?"
- " . . . that you have diabetes or high blood sugar?"
- " . . . that you have cancer or a malignant tumor of any kind except skin cancer?"
- " . . . that you have chronic lung disease such as chronic bronchitis or emphysema (not including asthma)?"
- " . . . that you had a heart attack, coronary heart disease, angina, congestive heart failure or other heart problems?"

(Continued on next page)

APPENDIX. (Continued)

“... that you had a stroke?”

1. Yes
5. No

Long Term Condition—Wave 1

“Do you have any health impairment or health problem that limits the kind or amount of paid work you can do?”

“Does any impairment or health problem limit the kind or amount of work you can do around the house?”

“What health condition causes this impairment or problem? (If more than one) What condition is the main cause?”

“Is this a temporary condition that will last for less than three months?”

“Have you had this condition before?”

“When did this impairment or health problem first begin to bother you (month & year)?”

NOTES

1. We exclude respondents of other races and ethnicities because the small number of cases (220 at wave 1) precludes analysis.
2. Between wave 1 and wave 2, 2 percent (164) of the Health and Retirement Study respondents died. Since death is the ultimate health limitation, ideally those who died should be included in an analysis of health. However we found that excluding respondents who died did not bias the estimated effects of living arrangements on health. We estimated models for each of the outcomes, with the dead treated three different ways: put in a separate category, put in the lowest category, and excluded. The results vary little. Therefore, our analyses exclude respondents who died between waves 1 and 2.
3. These analyses were straightforward post-estimation tests of hypotheses about the equivalence of coefficients. For self-rated health and mobility limitation we used adjusted Wald tests; for number of depressive symptoms, we used a chi-square test.
4. In analyses not shown, we tested whether the effects of household structure we observed actually reflected the results of household change during the two-year interval. The results suggest that our findings do not simply reflect household change. In models controlling for household change and interacting this change with wave 1 household structure we found a similar pattern of results to those reported in the text. Household change was significantly related only to number of depressive symptoms, primarily among men; however, this effect appeared over and above the main effect of wave 1 living arrangement.

In fact, adjusting for household change in most cases strengthened the main effects of living arrangements at wave 1, suggesting that the effects we observe are stronger among those who spent the entire period in that living arrangement.

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Mary Elizabeth Hughes is Assistant Professor of Sociology at Duke University. Her research centers on the relationship between social context and the individual life course, with a focus on family and health outcomes. With Linda Waite she is investigating the ways in which family and community contexts influence stress, loneliness, and health in later life.

Linda Waite is Professor of Sociology and Director of the Center on Aging at the University of Chicago, where she also co-directs the Alfred P. Sloan Center on Parents, Children and Work. Her research focuses on the family, from the youngest to the oldest ages. With Mary Elizabeth Hughes she is investigating the role of social contexts in the etiology of loneliness and stress, and their impact on health and well being at older ages.