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The Long-Term Costs of Caring: How Caring for an Aging Parent Impacts Wealth Trajectories of Caregivers

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for Prof Crane,

who has inspired me since I was old enough

to understand the meaning of my name

ABSTRACT OF THE DISSERTATION

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Long-term care in the U.S. is a growing concern as our aging population exerts pressure on formal and informal care systems. Public expenditures on formal care are increasing rapidly, even as reliance on informal caregivers expands. Recent policy innovations are shifting Medicaid and Medicare funding toward home- and community-based services (HCBS) as an alternative to nursing home care. This may help reduce overall LTC care costs to states and the federal government, but it also shifts more responsibility to families and informal care networks. Not only can caregiving have negative impacts on the physical and mental health of caregivers, but it also can be expensive, both in terms of direct costs and in terms of lost wages and work opportunities. However, to date, these financial consequences are not fully understood.

This project uses longitudinal, nationally representative data from six waves of the Health and Retirement Study (1998-2008) to evaluate whether caring for aging parents impacts caregivers' assets over time. Latent trajectory analysis was used to identify groups for whom caregiving had a negative impact on wealth trajectories. A four-group model fit best and revealed one group, with 4.3% of respondents, for whom caregiving had a significant, negative relationship. Further, race, education, and caregivers' health were significantly related to these

trajectories. Gender and marital status were not related. Lastly, among caregivers, care duration did not significantly impact asset trajectories, and care intensity had mixed effects.

Findings indicate that caring for an aging parent has a significant, negative impact for some adults over age 50, but only for a small group. Importantly, those who are negatively impacted are more likely to be in already vulnerable groups. As reliance on informal caregiving increases, special attention should be paid to those caregivers who may be particularly vulnerable to the financial impacts of caregiving; better assessments and more economic supports are needed to offset the potential exacerbating impacts of caregiving.

Introduction

Termed "The Forgotten Catastrophe" by U. S. Representative Henry Waxman in 1990, long-term care (LTC) financing remains a pressing health policy issue in the United States today – and yet, although the crisis has long been anticipated, it has been poorly prepared for. Twenty-three years ago, the U.S. Bipartisan Commission on Comprehensive Health Care (a Congressional task force also known as the "Pepper Commission") concluded that the nation was in urgent need of long-term care reform and that reform was in reach. Senator Rockefeller, chair of the Commission, wrote that reform faced a "clear field" for passage in Congress because such a program would be popular with the American electorate, most of whom, he said, "see themselves at risk of impoverishment if they or their family members need long-term care" (Rockefeller, 1990). His rosy prediction of clear and easy passage proved to be too optimistic, however, and 23 years later, significant reform has yet to be implemented.

Nonetheless, the crisis remains a popular topic for both health policy experts and the mainstream media, and the fear of impoverishment remains pervasive and very real for many families. Recent headlines, such as, "Live Long and Pay for It: America's Real Long-Term Cost Crisis" (Galston, 2012) and, "The Crisis in Long-term Care" (NYT, 2011), underline this fear. In fact, the U.S. has experienced a confluence of factors leading to unsustainable growth in long-term care costs. Changing demographics of the population, particularly with the aging of the Baby Boomer generation, have led to historically large numbers of people reaching age 65. As health care treatments have improved, longevity has increased so that those who reach age 65 can now expect to live nearly 20 more years (CDC, 2012). At the same time, 44% of older adults live with multiple chronic conditions, and the risk of chronic illness increases dramatically with age (Freudenberg & Olden, 2011). A few chronic illnesses in particular, such as Alzheimer's

disease, are associated with very high treatment costs because of the length of time care is needed and the intensity of that care, and unfortunately, the incidence of these diseases is increasing. There is nearly a 50% chance that a person will develop Alzheimer's disease or a related dementia by the time he or she is 85 (Hebert, Scherr, Bienias, Bennett, & Evans, 2003), and as the population ages, growing numbers of people are at risk for this emotionally and financially challenging disease. Meanwhile, rising health care costs – driven in part by innovations in technology and pharmaceuticals – have caused the per-person cost of these services to rise much more quickly than inflation. Combined, these factors create a situation in which both public programs and individual budgets are strained to the breaking point. Families already experience impoverishment with increasing speed as healthcare costs rise – a fact demonstrated by the growing percentage of LTC services paid for by Medicaid, which requires complete impoverishment of the care recipient as a condition of coverage (Komisar & Thompson, 2007; Shirey & Komisar, 2003). Simultaneously, this rise in dependence on Medicaid is straining state budgets. Thus, although LTC is most often discussed in health policy terms, it is increasingly clear that our longevity has become an economic liability.

Despite growing a growing sense of urgency about the issue, solutions have been elusive. Comprehensive policy innovation – of the scale described in the Pepper Commission report – is still needed, and yet recent attempts to develop major new programs, such as the Community Living Assistance Services and Supports (CLASS) Act, have failed. Some incremental changes have been implemented, mostly in the form of Medicaid waivers and demonstration project grants for payment system and care delivery reforms. However, these innovations are aimed largely at reducing federal and state burdens without addressing the costs to individual patients and caregivers. Without comprehensive approaches to financing long-term services and supports

(LTSS) for those with chronic care needs, the financial health of families is at risk, and this risk is growing. A large body of work has documented that economic security is associated with better health, mental health, increased civic participation, and other measures of wellbeing (see Braveman, Egerter, Williams, 2011, for a review of this literature). Currently, however, most public LTC payment streams do not protect assets, and in fact, they often require individuals to spend down assets almost entirely in order to fund LTC services.

The research hypotheses that are the focus of this dissertation grew from a larger set of questions about the impacts of our current LTC coverage system on the financial health of families: if individuals must become impoverished in order to qualify for Medicaid – and if many individuals who receive LTSS eventually do qualify for Medicaid – are there indirect economic effects for the families of care recipients? Further, when individuals do not end up requiring Medicaid coverage, but rely instead on the care provided by family members, are there economic effects for those who provide that care? And if so, are the consequences significant enough that the structure of our LTC system, which relies primarily on informal care and means-tested Medicaid financing, increases long-term financial vulnerability among families of care recipients by decreasing those families' ability to save for their own retirement and future LTC needs?

In the following chapters, therefore, I describe the scope of the long-term care problem – who receives care, who provides it, and what the costs of this care are for society and families – and review what is known about the economic impacts of informal care. Then I present analysis of three research questions that are motivated by the desire to understand the economic impacts of providing care for an aging family member. The findings from this analysis, and the

implications for social work practice and for future policy development, are discussed in the final chapters.

To provide some context for this analysis and discussion, a few definitions will be helpful:

1. *What is long-term care (LTC)?* Though seemingly straightforward, answering this question is complicated. A conservative definition of LTC is assistance with completion of “the basic tasks of everyday life, such as eating, bathing, dressing, toileting, and transferring," (Weiner, Hanley, Clark, and Van Nostrand, 1990; see also Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963). Broader definitions include assistance with instrumental activities of daily living, which include other important functions such as banking, cooking, and housekeeping (AHRQ, 2010; Lawton & Brody, 1969). The choice of definition can have significant implications for individuals seeking care, since some insurance plans and public programs only recognize the need for assistance with ADLs as a qualification for receiving coverage for this care; as a result, when individuals find that their ability to manage finances, cook, and manage their medications is diminished, they may be forced to rely on family members or friends for assistance, or to pay out-of-pocket for the help they need. Further, many plans only cover assistance when individuals need assistance with at least two ADLs, and so individuals who need help with just one are also left to find care elsewhere.
2. *What are long-term services and supports (LTSS)?* LTSS are the specific activities and programs that comprise LTC; they include direct-care tasks such as bathing, grooming, and feeding, as well as personal assistance such as running errands,

providing transportation, and managing medications. LTSS can also include assistance that provides more general support, such as coordinating care for the care recipient, scheduling appointments, and training caregivers.

3. *What is caregiving?* For the purposes of this dissertation, caregiving refers to the provision of care to someone requiring LTC. Caregivers may be paid professionals (i.e. social workers and nurses) or paraprofessionals (such as home care aides and personal care assistants); they may also be family members or friends who have no prior professional training as caregivers.
4. *What is formal care?* Formal care is the type of care provided by professionals and paraprofessionals, and it is generally paid for – through insurance plans, public programs, or by the care recipient and his or her family. Formal care may be provided in a number of settings, including nursing homes (also known as skilled nursing facilities or SNFs), assisted living facilities, or the individual's home.
5. *What is informal care*? For the purposes of this dissertation, informal care is the term that will be used to describe any type of care that is not provided by a paid professional or paraprofessional. In some discussions of caregiving, the terms "unpaid care" or "family care" are used. These can be misleading, however, because in some areas, nonprofessional caregivers may be compensated through programs such as "Cash and Counseling" (which is described in Chapter One); although the compensation is rarely equivalent to that received by formal care providers, using a term such as unpaid care may inadvertently exclude the informal caregivers who benefit from these types of programs. Likewise, using the term "family caregiving" may exclude the care provided by friends and neighbors, who are sometimes the sole

source of care for those in need of assistance. In fact, some retirement communities are designed with this kind of neighboring in mind – and it may be that, in communities where financial resources and access to formal care services are scarce, the assistance provided by friends and neighbors is vital, and that it is underrepresented in surveys that limit definitions of caregiving to the care provided by family members. A final note about informal care is that it is not mutually exclusive with formal care; that is, when a care recipient is receiving formal care services in the home or in a nursing home, she or he may also benefit from informal care. As a result, the number of hours of care received by an individual may add up to more than 24 hours a day.

Chapter 1: Scope of the LTC Problem

Who receives care?

Numbers. Given how varied the definitions of LTC are, it should come as no surprise that estimates of how many Americans require LTC vary as well. The Centers for Medicare and Medicaid Services (CMS) have estimated that nearly 15 million adults over age 18 receive LTC; of these, nine million are adults aged 65 and above, which is approximately 20% of the U.S. older adult population (CMS, 2012a). An additional 6 million adults below age 65 also receive care. These estimates are somewhat higher than those derived by Kaye, Harrington, and LaPlante (2010), who analyzed data from three nationally representative surveys to identify the number of people who need LTC. In their study, estimates of those needing LTC ranged from 10 to 12 million Americans, with roughly half of these belonging to the 65 and older population. Both of these estimates use the more restrictive "ADL-only" definition of LTC, however, and it is reasonable to assume that some people receive help with IADLs only, and are therefore not included in this count. Though the numbers vary somewhat, it is likely that roughly 4-5% of the American population requires some form of LTC currently (KFF, 2012). Further, while LTC is often thought of as an "older adult problem," LTC affects millions of people at earlier stages of the life course.

Demographics. LTC is an issue that reaches across socio-economic strata and other subdivisions within the U.S. population. At the same time, certain differences are important to note. A vast majority of LTC recipients live in the community: of the 10-15 million LTC recipients, only 1.4 to 1.8 million live in an institutional setting (such as a nursing home), while the rest live either alone or with family. Among those residing in nursing homes, more than 80% are above age 65, and the average age is 82 (Kaye, Harrington, & LaPlante, 2010). Meanwhile,

community-dwelling LTC recipients tend to be younger: only 45% are over the age of 65, and the average age is near 60. Women are more likely to be LTC recipients – most likely because women have longer life expectancy than men – and they are much more likely to live in nursing homes; in fact, almost two-thirds of nursing home residents are female.

Among the LTC recipients who receive care in their own home, 74% live in the home with spouses or other family members, and half of them have household income of less than 200% of the federal poverty limit (FPL), with a median household income of only $32,000 (Kaye, Harrington, & LaPlante, 2010). We know that 14 million people receive Medicaid-funded LTSS, which means that they have very low income and virtually no assets, or that they have spent-down their assets to nearly nothing (KFF, 2012b). However, not as much is known about how the income and assets of the families of Medicaid recipients differ from those of non-Medicaid LTC recipients. Still, even among the broad population of those aged 65 and over, the median household income was only $31,157 in 2009, and the median net worth was $170,494; further, 11% have incomes below FPL, and 8% have zero or negative net household wealth (Frye, Cohn, Livingston, & Taylor, 2011). Poverty among older adults, even with the supports available through Social Security, remains an important concern, and it is reasonable to expect that those who require LTC are even more vulnerable.

Data on racial and ethnic differences among LTC recipients is limited, but some evidence suggests that distribution of LTC recipients by race roughly mirrors the racial distributions of the population in general (Spector, Fleishman, Pezzin, & Spillman, 2000; Feng, Fennell, Tyler, Clark, & Mor, 2011). Interestingly, Feng, et al. (2011), assert that while growth in African-American and Latino populations in nursing homes is rising dramatically and consistently with growth in the overall population of adults aged 65 and older, the percentage of White nursing

home residents is actually dropping. This suggests that some disparities may exist in access to more preferred venues of care, such as home- and community-based care, with Whites having more choices than their African-American and Latino counterparts. Numbers derived by Kaye, Harrington, and LaPlante (2010) paint a slightly different picture. They find that the racial/ethnic distribution among LTC recipients differs slightly from the population at large, with minority representation slightly higher among LTC recipients. For instance, among those living in care facilities, Whites account for 82% of LTC recipients, African-Americans, 14%, and Latinos, 5%. Meanwhile, among community-dwelling LTC recipients, Latinos constitute 10% of the population, while 16% are African-American and 76% are White. The percentages of Asian/Pacific Islander and Native American LTC recipients in institutional care are lower than percentages of those living in the community (1.5% vs. 3%, and 1% vs. 2%, respectively). It may be that findings from Kaye, Harrington & LaPlante are not inconsistent with Feng, et al., since the latter study focuses on change statistics and seeks to identify an emerging trend. Further research is needed to understand the degree to which disparities exist in access to the preferred modes of LTC delivery, and to examine the degree to which pressure to provide informal care exacerbates existing vulnerabilities with regard to health and family financial security.

Who provides care?

Numbers. Among those living in the community, 92% of care recipients receive at least some help with activities of daily living (ADLs) from an unpaid helper such as a spouse, child, or friend, and at least 62% receive help *only* from informal caregivers. Like data on care recipients, estimates of the prevalence of caregiving vary. The Agency for Healthcare Research and Quality (AHRQ, 2010) estimates that 45 million Americans, or 15% of the population, are

involved in providing care for a disabled adult, while a recent study by NAC and AARP (2009) puts the number closer to 62 million. According to the most recent estimates by the MetLife Mature Market Institute (MMI, 2012), 10 million adults over age 50 care for a parent.

Demographics. As mentioned previously, informal caregivers are usually not compensated for providing care. Nearly half work full-time while also fulfilling caregiving responsibilities at home, and another 11% work part-time (NAC & AARP, 2009). Almost half (48%) of these caregivers are over the age of 50, with just 13% over the age of 65. As a result, the average age of caregivers is approximately 49, but this has been increasing gradually over time; the average age was 46 in 2004. Approximately 70% of caregivers are White, and roughly 13% are African-American. More than 42% of caregivers report household income of less than $50,000 per year, and the median household income is approximately $57,000. Fifty-eight percent of caregivers are married, and 37% have children or grandchildren living in their households; close to one-third (31%) also live with their care recipient. Most caregivers (66%) are women. Nearly one-third (31%) of caregivers have provided care for more than 5 years, and this number has increased in recent years. Clearly, LTC is not just an issue for the individuals receiving care, but also has ripple effects across families and communities across the United States.

Formal Care. As noted previously, informal caregivers are not the only people involved in providing care. Formal, direct care services are a vast and growing industry, which employs three million people nationwide (PHI, 2011). These workers help clients with both ADLs and IADLs, and provide companionship in some cases, especially for those who are unable to leave their homes, or for those who have moderate to advanced dementia and are not able to be left unattended for safety reasons. More than half of direct care workers (1.7 million) work in home

and community settings, and most are employed by for-profit agencies, while about 12% are either self-employed or employed by private households (DOL, 2012). The average homecare worker earns $17,000 per year, while nursing aides and home health care workers earning slightly more ($18,300), and personal aides earn much less ($13,000) (PHI, 2012). As a result, 47% of direct care workers rely on public benefits such as food stamps or Medicaid to supplement their incomes. Importantly, a disproportionate share of direct care workers are from minority populations: only 47% are White, while 30% are African-American and 16% are Latino. The average age of these workers is 42, but those who are self-employed or employed by private homes tend to be somewhat older at 48 years old, while those employed in nursing homes are slightly younger (40 years) on average. In other words, workers are often members of vulnerable groups, and, earning below-average wages in mid-life, are more vulnerable to economic insecurity in later life than the general population. Although analysis of the economic impacts of caregiving on these workers is not included in the present study, this is an important area for future research and policy development.

What does LTC cost and who pays?

In 2009, $240 billion was spent nationwide on formal long-term care services, with roughly 69% of this cost paid for by public programs such as Medicare and Medicaid (KFF, 2012). Most of the rest of the cost (19%) was borne by families, while only 7% was paid for by private insurance. Since the average cost of a nursing home stay in 2010 was $88,000 – with costs exceeding $100,000 in one-fifth of states – the burden on families can be quite substantial when neither private nor public sources of coverage are available. Nonetheless, fewer than 11% of Americans aged 55 and older, and less than 10% of the population as a whole, have private

long-term care insurance to help pay for this care (Johnson & Park, 2011). The rest rely on personal savings and public programs, meaning that for the majority of Americans, a lifetime's worth of savings may be lost if long-term care is needed. The following is a brief overview of the primary payment mechanisms for formal LTC. This context is important for understanding how the financial risk that grows with our increasing longevity is distributed across taxpayers in general, care recipients, and caregivers.

Private insurance. Although a very small percentage of LTC costs are paid by insurance plans, the presence of this source of coverage is important to note. Private LTC insurance products are available, but uptake of these products has been minimal; fewer than 10% of Americans are covered by a private LTC insurance plan and this level is decreasing (Andrews, 2010). This low uptake, combined with higher than expected inflation in health care costs and lower than anticipated interest rates, has led many insurance companies to drop their LTCI products (Schoeff, 2012). Ultimately, only about 7% of LTC expenses are paid for through private insurance (Kaiser Family Foundation, 2012), and this number is expected to decrease unless new market reforms are implemented.

The failure of the private LTCI market to thrive means that pressure on both individual budgets and public programs is growing. In fact, some speculate that the presence of Medicaid – which acts as the payor of last resort when private funds have been expended fully – serves to deter many families from purchasing costly private insurance products (Brown & Finkelstein, 2011). Evidence that purchase rates of LTCI increase as family assets increase is used to support this theory, because wealthier families have greater incentive to preserve their assets rather than risking asset spend-down through Medicaid. An alternative view is that families with fewer assets have more difficulty paying insurance premiums, which can range from $1,100 for a plan

purchased by a middle-aged adult with minimal benefits to over $16,000 per year for older individuals with more robust benefits. Debate continues about whether private insurance is untenable – meaning an expanded public insurance system is needed – or if the presence of any public safety net prevents the private market from succeeding. Either way, the net result has been an increasing dependence on public programs to pay for formal care.

Medicaid. Total Medicaid expenditures alone reached $429 billion last year, and although only 6% of Medicaid enrollees (4 million people) use Medicaid-funded LTSS, they account for roughly half of all Medicaid expenditures (KFF, 2012). The state share of this spending was $156 million in 2011, or approximately 23.6% of all state spending. For some states, Medicaid accounts for an even larger share of spending; Pennsylvania, for instance, spent nearly $8 billion, or 31% of the state budget, with another $14 billion spent in the state through federal matching funds (NASBO, 2011). Since most long-term care recipients are members of "mandatory populations" or require "mandatory services" as defined by federal law, the only recourse for states seeking to save money is to change the way that services are delivered (such as prioritizing home care over nursing home stays), or to drop coverage for other, non-mandatory populations. (For this reason, coverage for non-disabled adults under age 65 has virtually disappeared in many states.)

At the same time, a dramatic shift toward home- and community-based long-term care services is also underway. This shift has been partly driven by the need for states to save money – providing care in the home is widely perceived to be less expensive than providing care in nursing homes, although the evidence is mixed – but was also prompted in part in 1999 by a ruling of the *Olmstead v. L. C. and E. W.* ruling of the U. S. Supreme Court. The Court found that requiring LTC recipients to move into a nursing home to receive care was a violation of their

right to receive services in the community when medically appropriate (Department of Justice, 2012). This *Olmstead* decision prompted a rewriting of Medicaid policy to allow states to apply for waivers through which they could begin to provide care in non-institutional settings. A revolution in "consumer-directed services" has ensued, with a proliferation of waivers in most states and the resulting development of several program innovations that support not just care recipients, but also their informal caregivers. In 2009, this shift was codified in the Patient Protection and Affordable Care Act (PPACA or ACA; Public Law 111-148), which specifies a goal to “rebalance” Medicaid services “by expanding access to an array of home- and community-based services and reducing dependence on institutional care” (CMS, 2012). Several policy innovations are funded through the ACA to help states move toward this goal. For instance, the ACA institutes a major expansion of the “Cash and Counseling” model of care delivery, allowing Medicaid beneficiaries to receive cash benefits that they can use to purchase services, medical equipment, and home modifications or other needed products and services at their discretion. The ACA also includes an expansion of the “Money Follows the Person” program, which allows Medicaid dollars to be used to transition nursing home residents back into the community to receive care in their own homes or another community-based setting. Both of these programs give LTC consumers more discretion to determine what types of care they want to receive, who will deliver it, and where the care will be delivered. An important component is that care recipients often have the option to use funds to pay family members or friends to provide care, and to spend funds on home modifications that will facilitate independence.

Though these programs have potential to satisfy clients’ desire to remain at home and independent for as long as possible, there are a number of systemic challenges that limit the

effectiveness of these programs. First, a recent study of the Money Follows the Person program found that workforce shortages have proved to be a major barrier to connecting clients with HCBS (Watts, 2011). There are a number of reasons that this workforce has not responded to increasing demand. Certified nursing assistants and home health aides cite poor pay, lack of benefits, insufficient training and too few opportunities for advancement as the major reasons for job dissatisfaction, which indicates that major labor market reforms would be needed to make the shift to HCBS more wide-spread (Khatutsky, Weiner, Anderson, Ahkmerova, Jessup & Squillace, 2011).

Second, when clients choose to use funds to pay family members as caregivers, significant training is needed but is not always available. Furthermore, payments are not always enough to offset caregivers' lost wages and other expenses related to caregiving, and do not compensate caregivers for all the hours of care they provide. A study of Cash and Counseling programs in three states, Arkansas, Florida, and New Jersey, found that caregivers were compensated, on average, for fewer than half the hours of care they provided (Dale, Brown, Phillips, & Carlson, 2005). Their compensation ranged from $6/hour in Arkansas to just over $10/hour in Florida, but compensation for travel time and fringe benefits, like health insurance, were rarely provided. Further, in nearly a third of cases, payments were sometimes late, which means that they cannot be relied upon as a main source of income. These findings make it clear that while these programs do provide a small stipend to facilitate caregiving by family members or friends, the cash supports may not be enough to protect caregivers from the financial consequences associated with intensive caregiving responsibilities.

A third challenge related to these rebalancing efforts is that the programs are sometimes time-limited. In particular, Money Follows the Person allows for 12 months of transitional

services, at which point covered services revert to the regular package of Medicaid LTSS provided by the state. This often means that while some initial funding is spent on training informal caregivers and assisting with the transition back into the home, these supports disappear, leaving informal caregivers to assume the majority of responsibility for providing care. For this reason, states are seeing a growth in the number of participants who are readmitted to institutional care after their transitional period is over (KFF, 2011). There may also be adverse consequences for caregivers when the care recipient remains in the community and the transitional services end. Without sustained efforts to support caregivers, programs that prioritize HCBS may leave families exposed to risks of financial, physical, and emotional strain. Thus, although Medicaid bears the lion's share of the financial burden for LTC and states face dire financial crises that spur them to seek ways to reduce LTC spending, these Medicaid innovations may be exacerbating, not easing, problems faced by caregivers.

Medicare. Until very recently, Medicare has played a minor role in financing long-term care relative to the role of Medicaid. Although most Americans believe that Medicare will pay for their long-term care needs, the law is written in such a way that it only pays for care that 1) follows a hospitalization and 2) is reasonably expected to result in improved functioning. As a result, Medicare only pays for about 24% of LTC costs, or slightly more than is paid by individuals out-of-pocket (KFF, 2012). This amounted to $58 billion in 2009 – no small sum, but not nearly the price paid through the means-tested Medicaid program. However, this number may rise dramatically in the near future.

The rule that Medicare could only pay for LTSS that were expected to result in improved functioning was recently challenged in a class action lawsuit, *Jimmo v. Sebelius*, which was settled out of court by Department of Health and Human Services (HHS) in October 2012

(Miller, 2012). As a result of this settlement, for three years, Medicare will be required to expand its LTC eligibility criteria to include all skilled care (such as nursing or physical therapy) resulting from a hospitalization, even if it is not expected to result in increased functioning or cure. This settlement has the potential to radically alter the distribution of LTC financing, since many people who do not qualify for Medicaid may be eligible for Medicare-financed LTSS. As a result, care recipients' out-of-pocket costs may decrease, while the share of LTC paid for by the public will increase by an unknown amount. As of this writing, the settlement has not been finalized in court, and so impacts of the ruling have not yet been assessed. Additionally, it is unknown whether this policy change will only last the three years mandated by the settlement or if, once implemented, this change will become the new *status quo*.

Care recipients and their caregivers. The cost of formal care, to both families and society, is only part of the picture. The value of care provided by families, which is mostly unpaid, was estimated to be roughly $450 billion in 2010, and this figure increases dramatically each year (Feinberg, Reinhard, Houser, & Choula, 2011). This in-kind donation of time is important to recognize, in part because it represents an opportunity cost: time spent on caregiving is time that might otherwise be spent on other activities, including paid work, other volunteering, or leisure. As an opportunity cost, therefore, caregiving – even when separated from the loss in productivity that may result from caregiving's health effects – can be seen as a drain on the country's GDP. Traditionally, the value of informal care has been calculated using the going rate for formal care, not by estimating the opportunity costs. As a result, the actual impact of informal caregiving on GDP is unknown.

On top of their donations of time, families also incur direct financial expenses when meeting the care needs of family members, friends, and neighbors. Though estimates of out-of-

pocket expenses for caregiving vary widely, one recent study estimated the average annual expenses for each caregiver to be between $5,531 and $12,300 (Evercare/NAC, 2007). As discussed below, the sample used to derive this estimate is not nationally representative, and it is not known how many families experience this kind of financial drain; some may pay significantly more, if the care recipient has no assets but is not receiving Medicaid, while others may not spend any of their own money on care. However, if even the lower estimate by Evercare/NAC is accurate and generalizable, with nearly 45 million people providing care for a disabled adult over the age of 17, as much as $555 billion may be spent privately – on both formal care and indirect expenses such as legal services, out-of-pocket health expenses, and home modification such as ramps and bathroom grab bars – every year. In other words, household out-of-pocket expenses related to long-term care may be as much as 5% of annualized personal consumption expenditures in the U. S. Added to these direct expenses are losses due to taking time off of work, forgoing promotions, and contributing less to Social Security and savings/retirement accounts. It stands to reason that if the average caregiver experiences these kinds of financial responsibilities and consequences, not only can caregiving be expensive in the present, but it also may lead to delayed asset accumulation and insufficient retirement preparation among caregivers. As discussed in the next chapter, these potential impacts have not been sufficiently explored empirically – and although advocates for caregivers are inclined to use existing estimates to make the case for immediate relief for caregivers, more work is needed to understand the long-term financial impacts of caregiving.

In addition to the financial consequences of informal caregiving, the significant physical and emotional toll must also be considered in a discussion of the economic impacts of informal caregiving, since these result in higher morbidity and mortality for those who are providing

direct care (Pinquart & Sörenson, 2003). Perceptions of strain are highly correlated with the physical and mental health impacts, which is of particular concern because perceptions of strain are increasing as more care recipients are staying or moving back home rather than living in an institutional setting (Reinhard, Levine, & Samis, 2012). Although a more detailed description of the physical and mental health impacts of caregiving is beyond the scope of this paper, these impacts are relevant to the extent that informal caregiving decreases in individual's earning and saving potential and increases a caregiver's risk of experiencing his or her own LTC needs in the future. As mentioned earlier, health and financial capability are intertwined; therefore, although a review of the caregiver health literature is not provided here, any discussion of the potential for caregiver responsibilities to undermine financial capability is not complete without mention of the negative health impacts of caregiving. As a result, the health status of caregivers was included in the analysis conducted as part of this study.

Unfortunately, despite these expected financial burdens from long-term care, many households fail to prepare adequately for retirement and LTC needs. In fact, a recent study found that when long-term care insurance, health costs, and other retirement needs are taken into account, roughly 65% of all households will be "at risk" of being unable to maintain their standard of living in retirement, with probabilities increasing by generation such that a full 72% of Generation Xers (those born in 1965-1974) will be at risk (Munnell, Webb, Golub-Sass, & Muldoon, 2009). Even though mandatory Social Security participation provides a guarantee of some income in later life, most Social Security payments are not adequate to pay for significant LTSS. Thus, the significant tension between family and public financing of LTC remains unresolved – expenses on both fronts are unsustainable now, there is a risk that the problem will get worse, and no real solutions are on the horizon.

Chapter 2. What we know about the financial impacts of caregiving

As the foregoing discussion indicates, informal caregiving has significant direct and indirect costs. It is unknown, however, the extent to which these expenses have lingering effects on informal caregivers. It stands to reason that if caregiving leads to decreased income, it may also lead to decreases in retirement savings and other types of asset development. However, the direct impact of informal caregiving on lifetime asset accumulation has not been documented; instead, analyses of impacts on income and assets have used mostly cross-sectional data, and are often not nationally representative. This chapter offers a brief review of the literature and theories that relate to the economic impacts of informal caregiving, followed by a presentation of the research questions driving the present study and the hypotheses that were tested.

Previous Empirical Work

While there is a relatively large body of empirical work exploring the physical and mental health effects of caregiving, less is known about the financial impacts. A few studies have sought to quantify both the direct costs and the effects on wages for caregivers, but most of this research relies on cross-sectional data, uses samples that are not nationally representative, and is largely a-theoretical in approach. As a result, existing knowledge about the financial toll of caregiving is somewhat speculative, and requires generalizations that may or may not be supported by the data used.

One approach that had been used frequently to understand the financial toll of caregiving is to quantify the impact of caregiving on wages and work behavior among working caregivers. There is evidence that caregiving leads to a reduction in work hours, and that some caregivers take unpaid leave or quit working altogether in order to provide care (Stone, Cafferata, & Sangl,

1987; NAC/AARP, 2009). Conclusions about wealth are drawn by extrapolating long-term wealth impacts from information about loss of wages, foregone promotions and raises, and decreased contributions to pensions and Social Security. One influential and frequently cited study of this type is the Metlife Juggling Act Study (Metlife Mature Market Institute [MMI], 1999), which was one of the first attempts to quantify the full range of costs borne by working caregivers. The study concluded that respondents lost an estimated $659,139 in wealth over their lifetime as a result of lost wages and decreases in contributions to pensions and Social Security. Unfortunately, the study had a sample size of 55 respondents, all of whom were working and were selected because they reported that they had made accommodations at work as a result of caregiving responsibilities. The study is important because it attempts to quantify the costs in a wide range of domains, including foregone promotions and raises, decreases in contributions to savings and retirement funds, and expenses that reduce discretionary income. However, the study is not representative of all caregivers – and the estimated costs are not generalizable, even among employed caregivers.

More recently, MMI, in collaboration with National Alliance for Caregiving and the Center for Long-Term Care Research and Policy at the New York Medical College, revisited the topic by analyzing nationally representative data from the 1998 wave of the Health and Retirement Study (HRS) to further understand the costs to caregivers who are also employed (MMI, 2012). They estimate that in 2008, nearly 10 million people over age 50 were serving as caregivers for a parent – defining caregivers broadly as those providing help with basic personal tasks or providing financial assistance. They also found that the average loss to a working caregiver's retirement funds (defined as wages, pensions and Social Security contributions) was $304,000 for this population, with women losing more ($324,000) than male caregivers

($284,000). Again, however, these estimates are based on cross-sectional data, and include both caregivers who donate time and those who are providing financial assistance to a parent – a definition of caregiving that is broader than that used in many other studies. Because of the cross-sectional nature of the approach, it is unknown whether these impacts of caregiving are long-lasting, or if caregivers are able to recoup some losses after the caregiving experience has ended (either by returning to work or through bequests from the care recipient). Further, including those who provide financial assistance with those who provide time may confuse the issue of financial impacts – it is expected that those who help care recipients with expenses will see an immediate financial effect, while it is less clear whether caregivers who provide help with personal tasks also experience financial impacts.

Another approach to understanding financial impacts is to quantify caregiver expenses. For instance, in a telephone survey of 1000 self-identified caregivers, Evercare, in collaboration with the National Alliance for Caregiving (Evercare/NAC, 2007), asked caregivers to recall how much they spend on caregiving (or on behalf of their care recipient) in a typical month. Caregivers were defined as those who provided an average of five or more hours a week of assistance in the past month, and the assistance was defined as help with either ADLs or IADLS – that is, a fairly broad definition of caregiving was used. Respondents reported an average of $5,531 in direct caregiving expenses annually – more than 10% of the median income of the sample. Further, 38% of respondents reported cutting back on personal savings patterns in order to accommodate the costs of caregiving. Among the 41 people who agreed to keep a daily diary of expenses for one month, the average expenditure was much higher: $12,348. These figures are alarming, and have been used widely by the mainstream media, financial planners, and advocacy groups to demonstrate the financial toll of caregiving (see, for instance: APA, 2013; Carthage

Press, 2012; Wells Fargo, n.d.). In fact, the estimates are often generalized as an average for all caregivers; a CDC webpage for cancer caregivers, for instance, says, "Caregiving can create immediate and long-term financial problems for caregivers. Many caregivers give money to the patient—$200 per month on average—and spend an average of $5,531 per year out-of-pocket on expenses related to caregiving" (CDC, 2012). However, the study sample used to derive this figure is not representative of all caregivers in the U.S., and it may be that some caregivers spend far less. Further, some caregivers may spend this amount for a short time, but the long-term impacts on caregiver finances may be far less extreme.

Another approach used by some to investigate the financial impacts of caregiving is to assess caregivers' perception of financial strain. Most notably, financial strain has been incorporated into several larger assessment instruments, such as the Caregiver Strain Index (Robinson, 1983) and Modified Caregiver Strain Index (Thornton & Travis, 2003); the Zarit General Burden Inventory (Zarit, Reever, & Bach-Peterson, 1980); and the Cost of Care Index (Kosberg & Cairl, 1986). Further, one stand-alone financial strain assessment tool, the Financial Impact Scale, was developed by Todtman and Gustafson (1991), and has been used in at least one other small, mixed-methods study (Murdoch, 2003). Both the Todtman & Gustafson and Murdoch studies found significant financial strain among the populations surveyed, and yet unfortunately the Financial Impact Scale has not been validated with larger populations. Several other studies have assessed perceived financial strain as part of a broader assessment of caregiver burden (Cantor, 1983; Scharlach & Boyd, 1989). Cantor (1983), for instance, found that financial strain was a significant concern among all caregivers, but that the strain was most pronounced among spousal caregivers. Across all groups in Cantor's study, however, financial strain was not as much of a concern as physical and emotional health concerns. Consistent with this finding,

George & Gwyther (1986) found no evidence of financial strain among caregivers of people with dementia, despite finding evidence of significant negative impacts in the social and mental health domains of well-being. It should be noted, however, that the studies finding little or no evidence of financial strain reflect findings from the 1980s, and caregiver experiences are likely to be substantially different now.

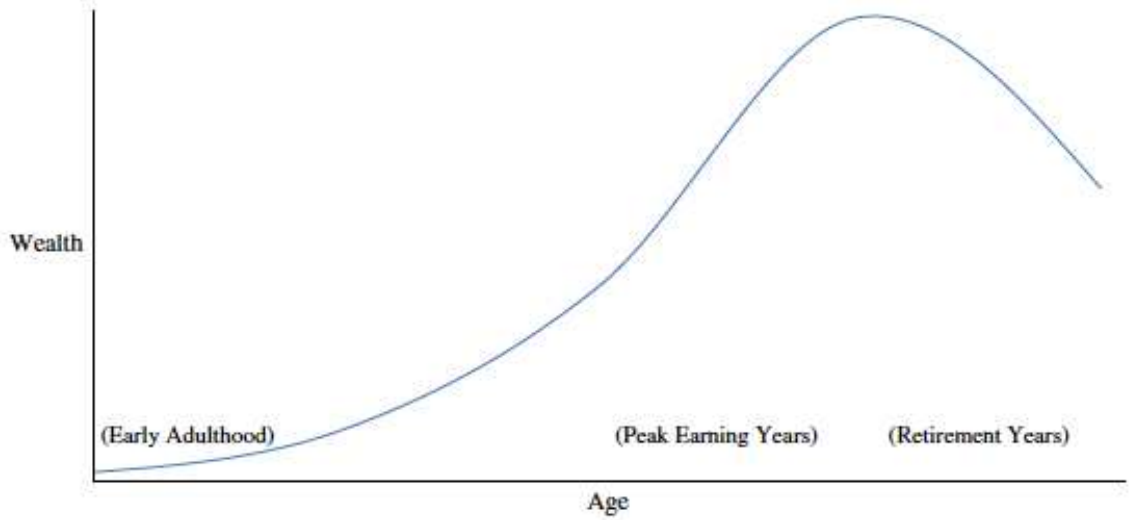
Together, empirical work over the last three decades suggests that there may be some negative impacts on income, which have the potential to decrease retirement preparation and asset accumulation. However, to date, this relationship has not been established using longitudinal analysis, and connections to existing theory about household savings patterns have not been made. A significant difference between this study and previous work is that this study uses a longitudinal approach to model the impact of caregiving on wealth over time, rather than at one discreet observation point. Another difference is that existing information about financial impacts are purely descriptive and have not been grounded in theory, while this study seeks to anchor an exploration of the relationship between caregiving and assets in an existing economic theory, described next, which is used to understand the longitudinal nature of asset accumulation and decumulation, but which has not been applied to caregiving to date.

Theoretical Framework

Life-Cycle Hypothesis of Saving. The concept of wealth trajectories is grounded in the life-cycle hypothesis (LCH) of saving, first proposed by Modigliani and Brumberg (1954), and expanded by Ando and Modigliani (1963), Kotlikoff, Spivak, and Summers (1982) and Modigliani (1986). LCH posits that savings occur across a lifespan in the shape of a bell curve, with net wealth starting at zero in childhood and adolescence – as parents invest resources into

children – and then increasing in early adulthood as the individual enters the labor market. Wealth accumulation peaks at retirement, after which dissaving or decumulation commences, with the expectation that wealth diminishes steadily until death (Modigliani and Brumberg, 1954), as depicted in Figure 1.

Figure 1. Life-cycle theory of wealth (Brown, 2011)



Later variations on this theory hypothesized that dissaving may be mitigated by a "bequest motive," such that an individual may retain some savings with the intention of passing it along as a bequest to children or other family members. This simple conceptualization has been challenged more recently; for instance, Blinder, Gordon and Wise (1981) found that in fact, among many families, dissaving in later life does not necessarily occur, and yet the bequest motive for savings is only weakly supported. An alternative explanation for the propensity to accumulate assets throughout retirement is that Social Security and other pensions may serve as a substitute for employment income later in life, allowing individuals to retain assets rather than spend them, but the substitution effect is not perfect and some evidence is contradictory (Blinder, Gordon and Wise, 1981; Land & Russell, 1996). Lastly, some hypothesize that those who are risk averse will retain assets in anticipation of expenses in later life related to health events or

other catastrophic needs; once again, however, there is scant evidence to support this hypothesis. Therefore, many questions remain about why some individuals save more than others, and why some spend down wealth later in life while others do not. Caregiving may be one of the reasons that some save and others do not, but this dynamic has not been explored fully.

Recent work in this field has investigated the effect of major life events, such as the loss of a spouse, on household wealth (Sevak, Weir, & Willis, 2003). Major health shocks later in life, including the onset of illness or a sudden accident causing disability, may also have significant impacts on income and assets (Hurd & Reardon, 2003; Lee & Kim, 2008; Smith, 1999). These impacts are found to be more lasting among the oldest old, and less so among those who are pre-retirement. Also, the financial consequences of poor health may be more significant for women than for men (Kim, 2006), as well as for members of minority populations (Bond Huie, Krueger, Rogers, & Hummer, 2003; Kim & Lee, 2005), and the effects of the two combine to make minority women particularly vulnerable to experiencing negative financial consequences from health shocks (Butrica & Iams, 2003). Thus, health shocks are widely understood to be one predictor of financial difficulty in later life, and yet studies exploring this phenomenon have focused almost exclusively on finances of the individual experiencing the health shock, not on the indirect effects on the caregivers. More work needs to be done to understand whether these health events have a similar economic shock effect on caregivers.

The life cycle hypothesis informs this study in three ways. First, it conceptualizes wealth accumulation/decumulation as occurring in a trajectory over time. Second, the theory incorporates the idea of shocks as a determinant of the shape of these trajectories. Third, it suggests that trajectories vary by subgroups, such as among women and racial/ethnic minority populations. However, economic studies that test the impacts of factors such as gender and race,

or the impacts of shocks from health or marital events, do not explain these impacts with a specific theoretical framework; therefore, adding a life course perspective to these economic analyses has the potential to clarify the changes in wealth patterns that occur among specific subgroups.

The Life Course Perspective. The life-course perspective locates families within multi-faceted social, historical and geographical contexts, while also acknowledging the links between individuals within the family and the trajectories of individual experience through time. As outlined by Elder (1998), the life course perspective identifies six principles that guide understanding of human development. Although the life-course perspective is not discussed widely in empirical studies of nationally representative economic data, the principles outlined by Elder, as described below, can offer important contributions to the exploration of household savings patterns.

1) Historical and geographic location. Individual and family experience must be understood in part as a function of the historical and geographic location in which they occur. For instance, the relevance of research into informal care in the U.S. in the 21st century is partly a function of historical forces: the baby boom, which has altered the ratio of older adults to children in society; medical and technological advances that help to extend life expectancies well beyond where they were 100 years ago (and well beyond where they are in less developed countries); and industrialization, which has spurred an increase in the geographical distance between family members while also increasing the financial resources available to families to pay for formal care services.

2) Timing in lives. The caregiving experience may be qualitatively different depending on when it occurs in someone's life. For instance, a growing body of literature focuses on the

"sandwich generation," comprised of those who are both raising children and caring for an aging parent(s) simultaneously. The pressures and rewards of this experience may be quite different than those experienced by a 70-year old caring for an ailing spouse, and, particularly relevant for this analysis, the long-term financial impacts of caregiving may change substantially based on the timing of the caregiving experience.

3) Linked lives. This principle acknowledges that individuals' lives are interconnected, and that the experience of one family member may well impact that of another. This is particularly relevant to instances of caregiving. One person's long-term health need, and the resulting financial impacts on the care recipient, may have important ripple effects both within the family and among seemingly unrelated individuals – for instance, when coverage for LTC services creates strain on state budgets and prompts cuts in other state expenditures.

4) Human Agency. The life course perspective asserts that even though various social and historical contexts influence individual experience, individuals are still actors in their own lives. Thus, although external contexts may impact the financial wellbeing of caregivers, they are also impacts by their own degree of risk aversion, propensity for saving, career choices and ability to work before, during and after the caregiving experience.

5) Diversity of Experience. This principle recognizes that while some commonalities are inherent in cohorts of individuals – baby boomers, for instance, have experienced certain historical landmarks that helped shaped their experience collectively – there is still important heterogeneity of experience within cohorts. Among caregivers, these within-cohort differences will be equally important; that is, the experience of female caregivers may be different than that of male caregivers, and the degree of self-determination available to individuals may vary by culture of origin, neighborhood, and other socio-economic factors.

6) Cumulative effects of advantage and disadvantage. Usually, caregiving for an older adult occurs in mid- to late-life. Prior to this experience, various life experiences may have helped an individual either to build resources for resilience, or to compromise their capacity for resilience. Thus, the caregiving experience may occur in two individuals' lives when they are the same age and under similar contextual circumstances, but will be qualitatively different because of previous life experiences and the cumulative effects of advantage and disadvantage. These differences may lend crucial insight into why some caregivers report that the caregiving experience is rewarding, while other report adverse effects on health, mental health, and household finances.

When household savings patterns are viewed from the perspective of these six life course principles, an important conclusion is that wealth trajectories may not be homogenous, but instead may differ substantially depending on historical, social, and personal contexts. Brown (2011), for instance, found that the negative effects of race and gender intersect and accumulate over the life course, such that Black women have very low levels of net worth and that these levels remain relatively flat, rather than increasing as the LHC hypothesis would suggest. Cross-sectional analysis of wealth for women and men of color produced similar findings: wealth disparities exist by race, with African-Americans and Latinos having vastly lower amounts of wealth than their White counterparts, and for women, who have much lower amounts of wealth than men (Oliver & Shapiro, 2006; Chang, 2012). The race and gender gaps have intersecting impacts, such that women of color have the lowest median wealth when compared both to men of color and to White women (Chang, 2010).

In sum, not only may wealth trajectories differ in magnitude – that is, some individuals may have a much steeper wealth accumulation curve than others – but the trajectories may also

differ in overall shape: some may follow the standard bell shape, while some others may remain flat, and still others may have dips related to shocks, as described above. The potential for heterogeneity in wealth trajectories has important implications for selection of analytic methods, as discussed in the next chapter.

Study questions

As suggested by the life course perspective, the potential negative financial impacts of caregiving may have particular relevance for those who are already financially vulnerable. Women, for instance, are more likely to experience poverty in later life than men (Hudson, 2010), and since a majority of caregivers are women, the financial consequences of caregiving may compound an existing economic disadvantage. Similarly, some minority populations in the U.S. – African-Americans and Latinos in particular – have higher rates of poverty overall and may be disproportionately strained by the demands of caregiving (Collins, Hall, & Neuhaus, 1999; Rank & Williams, 2010). Thus, while caregivers overall may be conceptualized as a vulnerable population, subgroups such as racial minorities and women may be especially vulnerable, and therefore particularly relevant to social workers and policy makers.

Caregiving can have economic effects in a number of areas such as income, employment status, and wealth (or net worth), which includes savings, pensions and retirement accounts, investments, home equity and/or business equity, minus any debts. In this study, *wealth trajectories* are the dependent variable of interest, rather than income and employment status. A wealth trajectory is the pattern of asset accumulation and decumulation over time (Bernheim & Scholz, 1992). The aim of the study is to identify how the experience of providing informal care to a parent impacts caregivers' wealth trajectories. Because little is currently known about

investment and saving patterns among informal caregivers, the study seeks to identify the relationship between caregiving and wealth trajectories first by comparing caregivers to noncaregivers. Then, because certain groups are more vulnerable to poverty than others, the study examines differences in wealth patterns among caregivers who differ by various caregiver attributes – such as gender, race, and income – and by attributes of the caregiving experience, such as duration and intensity. The following research questions, therefore, guide the investigation:

Research Question 1: Does caregiving affect wealth trajectories?

Hypothesis 1.1: Caregiving will be negatively associated with wealth trajectories.

Research Question 2: Do caregivers' wealth trajectories vary by caregiver attributes?

Hypothesis 2.2: Female caregivers will experience greater negative change in wealth trajectories over time than men.

Hypothesis 2.3: Race/ethnicity will predict membership in groups for whom caregiving negatively impacts wealth trajectories.

Hypothesis 2.4: Education will predict membership in groups for whom caregiving negatively impacts wealth trajectories.

Hypothesis 2.5: Caregivers' health will be negatively associated with wealth trajectories in groups for whom caregiving is also negatively associated.

Hypothesis 2.6: Marital status will predict membership in groups for whom caregiving negatively impacts wealth trajectories.

Research Question 3: How do the duration and intensity of the caregiving experience impact caregivers' wealth?

Hypothesis 3.1: Duration of the informal caregiving experience is associated with a

larger negative effect on caregivers' wealth trajectories over time.

Hypothesis 3.2: Intensity of the caregiving experience is associated with larger negative effect on caregivers' wealth trajectories over time.

Chapter 3. Data and Methods

Challenges of testing of wealth hypotheses

Despite the predominance of the LCH and life course perspective as an explanatory model of household savings patterns, there have been few direct empirical tests of the theory, in part because such tests have proved difficult to accomplish. Bernheim (1987), in fact, provides the first empirical test using longitudinal, panel data, and finds the theory not fully supported by the data. Land and Russell (1996) mention the challenges related to finding suitable longitudinal data; in particular, they argue that data extending across the lifespan is needed to fully test the LCH. Many data sets that collect comprehensive economic data from households do not collect panel data for more than a few years. As a result, most studies rely on cross-sectional analysis to make longitudinal inferences about life cycle savings behavior.

This study seeks to address some of the data and methodological challenges, while acknowledging that difficulties remain. First, the study uses data from the Health and Retirement Study (HRS), which contains comprehensive household economic data from a nationally representative panel of adults aged 51 and above. The dataset does not contain complete life-cycle data for respondent households at this time – respondents enter the study at age 51 or above, and although their families (including children) are tracked, even the oldest original respondents and their offspring have not been in the study long enough to have complete life cycle information yet. However, there is the potential to study respondents who entered the study while still in their peak earning years, and who are tracked until death.

Second, the study conceptualizes wealth as occurring in a trajectory that is latent – not directly observed, but measured in part through regular observations of asset holdings and debt. In the case of the HRS, values for these measures are observed every two years; thus, although

complete life cycle data is not available, inferences about later life may be drawn by analyzing multiple waves of data to understand the latent trajectories that may be at work.

It is important to note the particular challenges that accompany applying latent growth curve analysis to wealth measures. First, wealth is notoriously skewed, and the distribution of wealth across negative and positive values makes statistical transformations problematic. Friedline, Masa, and Chowa (2012) provide a helpful review of these challenges, and propose several approaches to transformation of wealth data. A more detailed explanation of how the skewness challenges are dealt with in the present study is provided below.

Another challenge implicit in applying longitudinal approaches to analyzing wealth data is that linear growth curve models assume that wealth occurs in a homogenous pattern across the population – that is, that while the starting values and magnitude of change may differ across respondents, the overall pattern of wealth accumulation and decumulation will look the same. Latent growth curve models take a different approach by allowing group-based analyses, in which both the shape and the magnitude of trajectories may fall into natural groupings. Two major types of growth curve analyses have emerged from this perspective: growth mixture modeling, as described by Bollen and Curran (2006), which uses an SEM framework to test categorical groupings of trajectories that may be either linear or quadratic in shape, and group-based growth modeling, as described by Nagin (1999), which uses a similar approach but assumes homogeneity within groups in order to test between-group differences that may be linear, quadratic, or cubic. A strength of these approaches is that both time-varying and time-invariant covariates can be tested for their impacts on the outcome variable, although the growth mixture models test direct effects of covariates at each wave on the outcome measures at each wave, while the group-based growth models allow testing of the effects of the covariates on both

the starting parameters and the trajectory shape (as expressed by the linear, quadratic, and cubic terms).

All three of these approaches have strengths and limitations, and, therefore, selection of method is most appropriately driven by the theory of change that is being tested. For the purposes of this study, linear growth curve modeling would be inappropriate given the life course perspective, which suggests that a variety of trajectories may emerge based on the cumulative experiences of individual respondents. Further, the ability to test cubic terms is important, particularly for testing whether the financial impacts of caregiving were significant but short-lived – causing a short-term dip in net worth with a subsequent rebound (which might imply a cubic trajectory shape) – or if the effects were more lingering (implying a linear or quadratic shape). Therefore, the group-based growth modeling approach was selected as best suited to test the theory of change in wealth described above.

Study design

To understand how wealth trajectories differ between caregivers and noncaregivers, and among subgroups of caregivers, this study utilizes data from a panel of respondents who were not caregivers at the start of the study, but who became caregivers for a parent or parent-in-law at some point during 10 years (6 waves) of observations. These respondents were compared to those who never became caregivers during the study, and, within caregivers, comparisons were made by caregiver attributes such as gender and race. Additionally, information about the types of long-term care services being used by the care recipient allowed for examination of how the use of formal care services impacted the caregivers' wealth trajectories.

This investigation focuses on parental caregivers and not spousal caregivers. There are

several reasons for this design decision. First, parental assets are not included in the caregivers' household asset measure in the HRS. By contrast, in cases of spousal caregiving, the financial impacts of the care recipient's health status would be confounded with the financial impacts of the caregiving experience. Further, there is some evidence that there are meaningful differences in caregiver outcomes depending on the relationship of caregiver to care recipient – for instance, spousal caregivers tend to have more mental health difficulties than parental caregivers (Pinquart & Sörenson, 2003). Therefore, focusing on only one type of caregiver/care recipient relationship may avoid some of the confounding effects of relationship dynamics. Lastly, because more than 50% of caregivers in this age range provide care for a parent or parent-in-law (NAC/AARP, 2009), concentrating on parental caregivers provides relevant and useful information about the caregiving experience for people aged 50 and above.

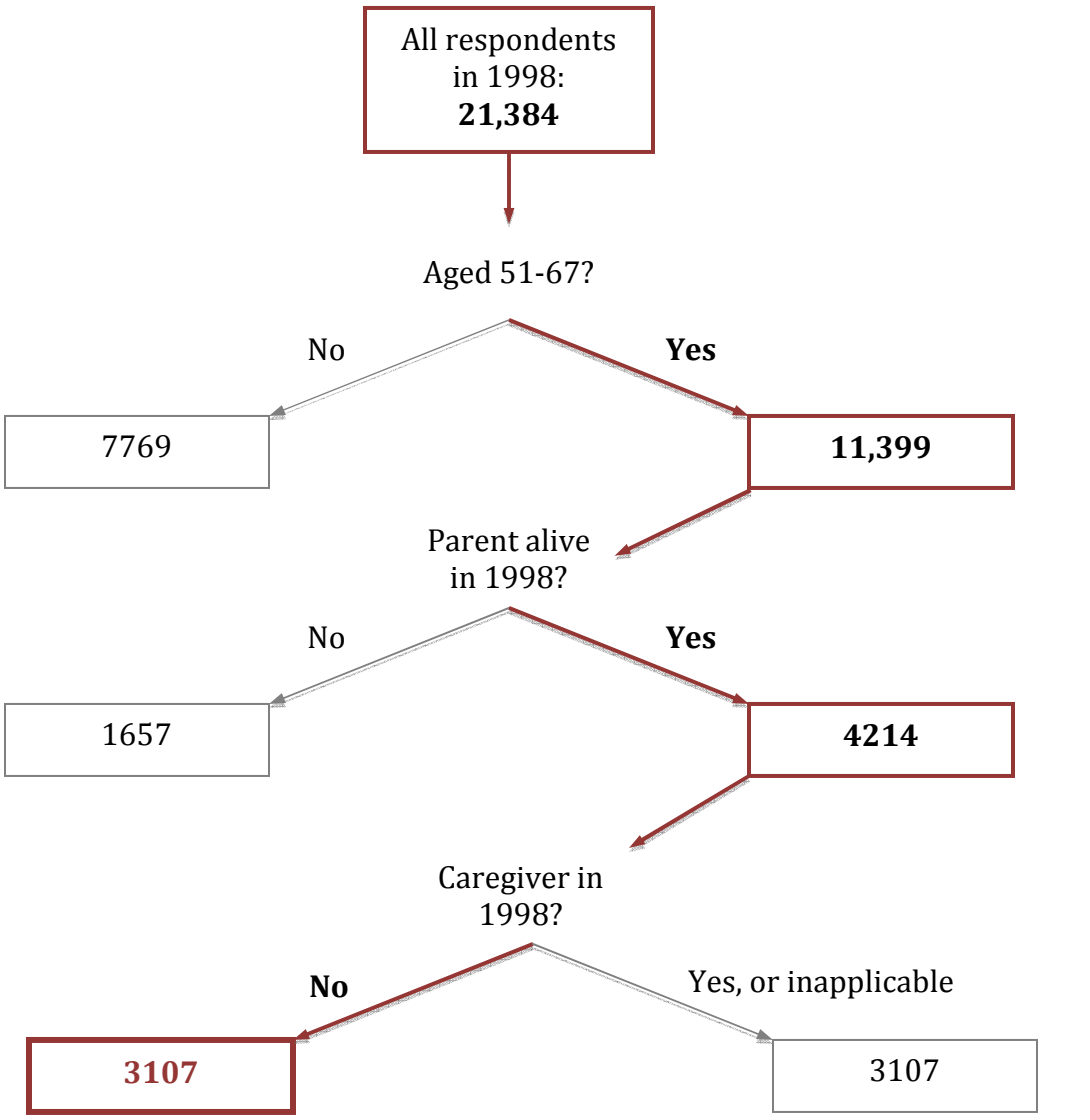
Sample

Data for this study is drawn from the Health and Retirement Study (HRS). The original HRS cohort, sampled and surveyed in 1992, is a nationally representative sample of individuals born from 1931 to 1941, with oversampling for African-Americans, Latinos, and residents of the state of Florida (Heeriga & Connor, 1995). Surviving respondents have been surveyed every two years since 1992. The HRS has since expanded to include additional cohorts of older adults so that it now provides statistically representative samples of all U. S. households with adults aged 50 and above (Hauser & Willis, 2005). Designed to collect information about financial status, labor participation, and health within the households, the HRS is now a leading source of information about older adults in the United States (National Institute on Aging, 2009).

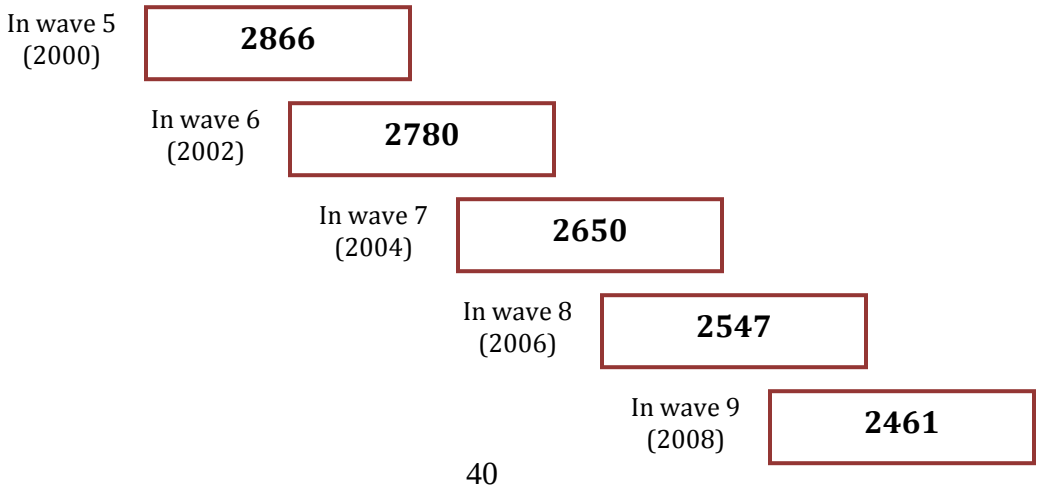
Because of substantial variation in measurement of caregiving in the first three waves of

HRS data collection, data for this study are drawn from waves four through nine (1998-2008). Inclusion criteria at baseline for this study were: (a) respondents had a parent or parent-in-law alive in 1998; (b) respondents were aged 51-67 in 1998; and (c) respondents were not caregivers for a parent at baseline, as discussed above. There were 3107 individuals meeting these criteria in 1998. Including only noncaregivers at baseline allows for creation of a comparison group of individuals who never became caregivers during the 10 years of observation in this study. Figure 2 shows the number of people at each wave who identified as caregivers for either a parent or parent-in-law. It is expected that there will be significant, but not complete, overlap of identified caregivers from wave to wave.

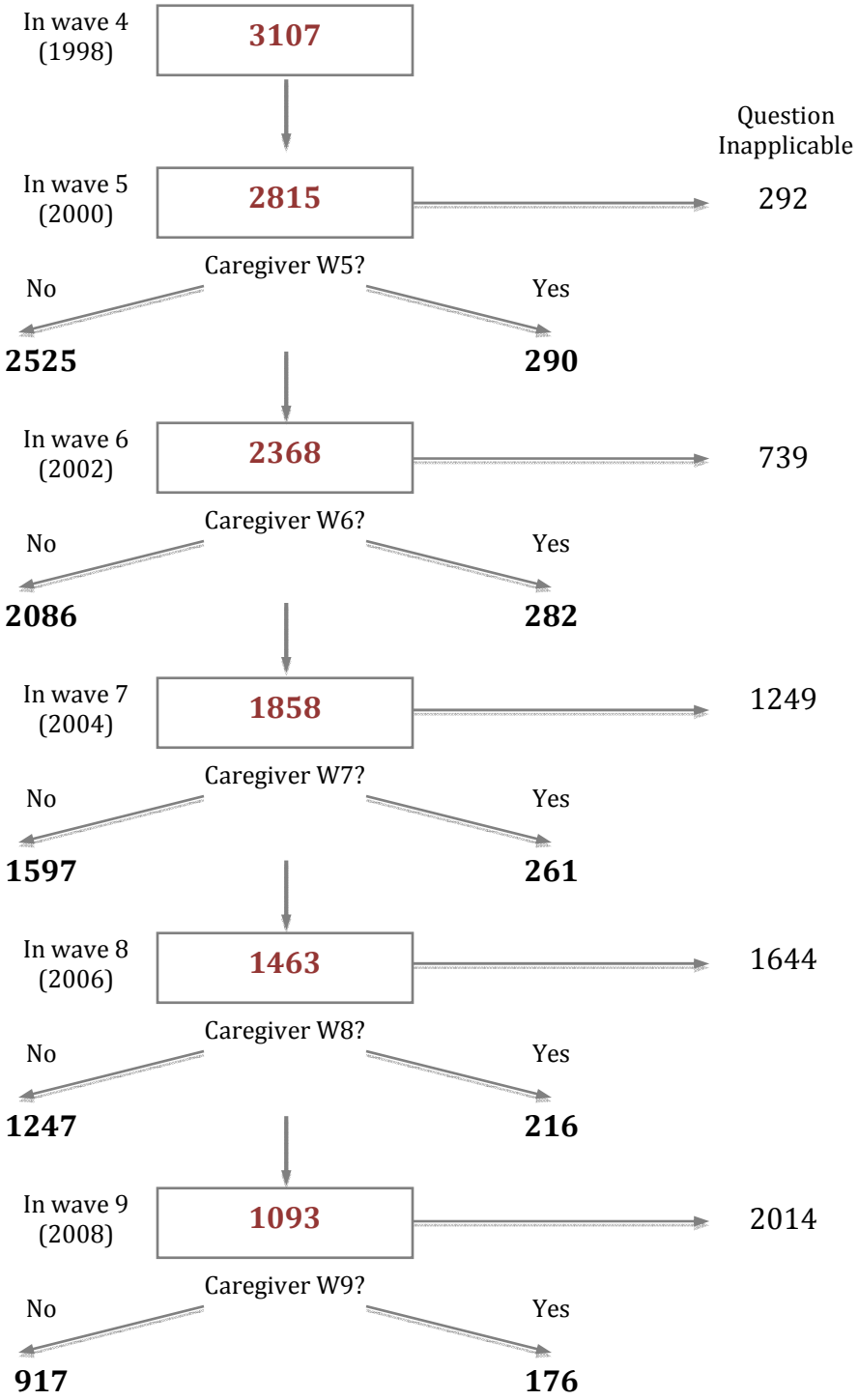
Figure 2. Description of Dissertation Sample



Respondents remaining, by wave:



Number of ADL caregivers in each wave



Power Analysis. Power issues were considered for all analyses. Although no specific test of statistical power is available for latent growth curve analysis, a data set with at least 300 cases is generally considered to offer sufficient power for analysis (Andruff, Carraro, Thompson, Gaudreau & Louvet, 2009).

Measures

Wealth. The dependent variable for all measures was the net worth of respondents' households after accounting for debt, as described below. Total dollar value, rather than the amount of change as a percentage of total wealth, was used because the total value allowed for plots of trajectories of wealth to be created, which provided added clarity for interpretation.

Construction of wealth measures varies quite a bit in the literature. This is an important consideration, both because inclusion and exclusion of certain types of assets may significantly alter the findings. For instance, some studies in the economic literature include pensions, Social Security contributions, and stock investments but do not include housing equity (Shapiro, 2006); similarly, business equity is not always included. Home and business equity are often excluded to keep the asset measure consistent with Medicaid eligibility criteria or because they are not always used as a source of income during retirement; however, borrowing against such equity may be an important source of funds upon which caregivers can draw during times of intense caregiving, and therefore their value may be directly impacted by the caregiving experience. Therefore, wealth was operationalized here as the sum of savings, pensions, investments, and home and business equity, minus any debts reported by the respondent. This is consistent with studies on wealth by Attanasio and Hoynes (2002), Brunnermeier and Nagel (2001), Friedman and Sjogren (1981), and King and Leape (1987).

A second challenge with regard to measurement of assets is determining whether to include income as part of a measure of overall household wealth. Certainly income is important in determining ability to purchase formal care, and at the same time having a higher amount of income may allow some households to forego spending down assets or accumulating debt. For these reasons, some studies in the economic literature use household wealth – including both assets and income – as the dependent variable (Smith, 1999), while others break income and wealth into separate categories, often looking at just income rather than at wealth. However, since contribution to savings, pensions, and other investments is dependent in part on income, adding the two may work as a measure of wealth for cross-sectional analysis but may confound the findings when used as a single dependent variable in longitudinal studies. Thus, for the purposes of this study, the sum of assets minus debts was considered to be the relevant variable, with an understanding that income, as an independent variable, was significantly correlated to wealth.

In all analyses, the RAND imputations for these variables were used; the values were converted to 2008 dollars using consumer price index conversion values, then divided by the number of wage earners included in the household in order to account for the fact that assets and debts were measured at the household level, while key covariates, such as race and gender, were measured at the individual level. In order to address issues of skewness, a log-transformation of the wealth variable was used; $\log_{10}$ was chosen for ease of interpretation, although sensitivity analysis with a natural-log transformation was also conducted and did not result in significantly different results. Because wealth ranges from negative to positive values, and includes zero values, transformation was accomplished by adding $1 to all values, taking the absolute value, applying the $\log_{10}$ transformation, and then reapplying the negative sign when appropriate. The

transformation improved the skewness and kurtosis dramatically, as shown in Table 1. Although the skewness and kurtosis of the transformed wealth variable are still slightly outside the preferred range, the LTA method is a semi-parametric analysis method, and is robust to non-normality in the dependent variable (in fact, it assumes non-normality).

Table 1. Measures of central tendency, dependent variable at baseline.

	Range	Mean	Median	Mode	S.D.	Skewness	Kurtosis
Assets, adjusted	-$2,390,848.94 to $20,976,253.30	$251,767.35	$103,562.00	0	654,271	15.92	413.47
Assets, Log_2	-14.69 to 16.86	10.41	11.55	0	4.52	-3.20	10.61
Assets, Log_{10}	-6.38 to 7.32	4.52	5.02	0	1.96	-3.20	10.61

Independent variables. Many of the major independent variables were time variant, such as marital status, health, income, and caregiving status. Other variables, such as education and ethnicity, were assumed to be invariant across time. Notes on the operationalization of each measure within the survey are provided in Table 2. The role and time-variance status of each variable are also noted.

Caregiving status is a dichotomous variable generated by questions about whether the respondent has spent at least 100 hours in the previous 12 months providing personal assistance with ADLs to a parent and/or step-parent. This is expected to vary over time, but all respondents will have a caregiving status of “no” or “0” at wave one. A separate measure of caregiving, which measures assistance with “personal errands” – or activities generally classified as IADLs – is also available in the dataset; for the purposes of this study, however, caregiving was operationalized by the more restrictive definition of providing ADL care. Assistance with ADLs is generally thought of as more intense and potentially stressful than assistance with IADLs because of the personal nature of ADL tasks (such as bathing and toileting). People needing ADL assistance usually have a higher level of disability than those who only need assistance

with IADLs, and so it may be that caregivers who assist a parent with ADLs experience higher levels of stress, more impacts on work, and, therefore, a larger negative impact on assets.

Other independent variables used in research questions one and two are fairly standard measures of demographic and socio-economic status; these include race, gender, self-reported health, education, marital status, and income. It should be noted that the HRS dataset oversamples African-American and Hispanic respondents; when sampling weights are applied, analyses can test differences among Whites, African-Americans, and Hispanics, but finer distinctions cannot be tested. For this study, person-level weights from 1998, the first observation point in the study, were used for all analyses. Using the first-wave weights rather than the last-wave weights allowed for the data from every original member of the sample to be used, regardless of their dropout status in subsequent waves.

Because time-invariant measures are included in the trajectory models as dichotomous "risk factors," race was dummy-coded into three dichotomous measures: White vs. other, African-American vs. other, and Hispanic vs. other. Also, because of similar methodological limitations, marital status at each wave was recoded into a dichotomous measure of married/partnered vs. unmarried. Those who were divorced, widowed and never married were collapsed into one group. Lastly, a similar transformation was applied to the time-invariant measure of education: those with 12 years of education or less were grouped together and modeled against those with more than 12 years of education.

For research question three, time-variant measures of caregiving duration and intensity are used. Duration is measured by summing the number of observations in which the respondent reported providing care for a parent or step-parent; two measures are used to capture those who only provide ADL care and those who help with ADLs, IADLs, or both. These are crude

measures of caregiving duration, since the actual start dates and end dates for caregiving responsibilities are not known; however, variation in this approximate measure of years spent caregiving may still be meaningful in relation to latent asset trajectories. For the second hypothesis, the effect of caregiving intensity is modeled using a continuous measure of the number of hours of care provided during the previous two years as reported by the respondent. One important note is that, when respondents are initially unsure about the number of hours of care, some data on caregiving intensity are imputed by HRS staff based on respondents' answers to probes about hours of care.

Table 2. Description of Study Measures

Construct/Variable	Description/Question	Role
Wealth		
Home equity	Current value of your home, minus amount owed on it. (continuous)	DV, time variant
Pension/IRA wealth	Type and amounts in the top three pension plans. (continuous)	DV, time variant
Investment wealth	Questions about stocks, bonds, treasury bills, other investments. (continuous)	DV, time variant
Savings wealth	Total amount in checking and savings accounts. (continuous)	DV, time variant
Business wealth	Total value of business holdings, minus amount owed. (continuous)	DV, time variant
Debt	Seven items assess debt including type (credit card, medical, life insurance policy loans, loans from relatives) and amount owed. (continuous)	DV, time variant
Total Wealth	**(Assets – Debt)**	**DV, time variant**
Income		
Employment income	Income from work for pay (continuous)	IV, time variant
Non-employment income	Questions re: amount of income from Workers' Compensation, Unemployment Insurance, and SSI/SSDI (continuous)	IV, time variant
Social Security income	Amount of Social Security Income (not SSI or disability); (continuous)	IV, time variant
Total Income	**(Employment + Non-employment + Social Security)**	**IV, time variant**
Caregiving Experience		

Caregiving status	Dichotomous based on response to following two questions:	IV, time variant
ADL assistance	Did you or your partner/spouse spend at least 100 hours in the past 12 months helping your mother or father (or step-parent) with basic personal activities like dressing, eating, and bathing?	IV, time variant
IADL assistance	Did you or your partner/spouse spend at least 100 hours in the past 12 months helping your mother or father (or step-parent) with other things such as household chores, errands, transportation, etc.?	IV, time variant
Caregiving duration	Continuous measure, calculated by summing number of observation points at which respondent was a caregiver for at least 100 hours in the past 12 months	IV, time variant
Caregiving intensity	Continuous measure of number of hours reported in each wave; the measure is imputed using hotbox imputation when caregivers do not provide an estimate of hours (Smith, 1995)	IV, time variant
Socio-Demographics		
Age	Respondent age at time of observation.	IV, time variant
Race	Measured for each respondent at entry into the study, as determined by response to these two questions: "Do you consider yourself primarily white or Caucasian, Black or African American, Other?" and "Do you consider yourself Hispanic or Latino?"	IV, time invariant
Gender	Measured dichotomously (male/female), and is input by the interviewer rather than in response to an interview question.	IV, time invariant
Marital Status	Measured at each wave with a series of questions based on status at intake; measure is cleaned and imputed by RAND, and operationalized as categorical with the following categories: Married, Married/Spouse absent, Partnered, Separated, Divorced, Separated/Divorced, Widowed, Never Married.	IV, time variant
Education	Education is measured for each respondent at entry into the study, as determined by response to this question: "What is the highest grade of school or year of college you completed?" (continuous)	IV, time invariant
Self-rated health	Health is assigned based on health of respondent at each wave, as determined by response to this question: "Would you say your health is excellent, very good, good, fair, or poor?"	IV, time variant

Analytic Strategy

Data preparation and preliminary analyses. In preparation for testing hypotheses, all independent variables were examined to understand their distributions and to test for normality. As described above, wealth measures were transformed using a $\log_{10}$ transformation to address skewness. Similarly, income measures were also transformed with a natural log. The RAND

dataset was used whenever possible, which means that all variables – except the measures of caregiving status, duration and intensity – were cleaned and imputed by RAND. In most cases, this involved "logical imputation," meaning that, when possible, missing answers are imputed based on answers to related questions. For example, if a respondent indicated that his or her father had deceased in one wave, but values for this measure were missing in subsequent waves, the "deceased" status was carried forward (RAND, 2011).

Imputed measures are not available for the caregiving variables, and, because of the skip patterns built into the HRS interviews, missing values in caregiving present something of a challenge. Respondents were asked at each wave whether they provided 100 or more hours of care to their mother or father (or step-mother and/or step-father) in the past 12 months. The first set of questions refers to "personal care such as dressing, eating, or bathing;" a second set of questions refers to "other things such as household chores, errands, transportation, etc." Respondents were given opportunities to list multiple care recipients in all cases, and details about the care, including an estimate of the number of hours of care provided, were obtained for each care recipient. Response options for the initial caregiving questions at each wave include "yes," "no," "don't know," and "refused." The measures were set to missing during the interview if the interview was truncated or if a skip pattern was invoked – that is, when a question was deemed "inapplicable" for a number of reasons, which included situations in which the parents had been marked deceased in a prior wave, the designated respondents for family questions was not available, or the interview was incomplete for other reasons. As a result, there is a large number of values in each wave that are set to missing, but some values are missing at random while others are attributable to parent mortality. For the purposes of this study, all missing cases are left as missing, and the few respondents who answered "don't know" or who refused to

answer the question were recoded to “missing” as well. As discussed below, adjustments for missingness due to parent mortality are addressed in model building rather than through imputation.

With the exception of missing values in the caregiving questions, most missingness in the dataset is attributed to death or respondent drop out. Attrition by death was responsible for less than 3% of attrition at each wave, as illustrated in Table 3. Latent trajectory analysis is robust to missing values when they are MAR or missing completely at random, as long as values are available for at least one wave for each case. In this situation, the underlying latent data structure is analyzed with maximum likelihood estimation using the available observed values (Bollen & Curran, 2006). Because missingness in the caregiving values is not missing at random – that is, the reason for some missingness is attributable to parent mortality or respondent drop-out – variables that correlate with this observed missingness are included: one variable for wave participation is included to account for wave-to-wave drop out, and one variable indicating whether there is at least one living parent is included to account for missingness due to the “inapplicability” of the question (Ferrer, Hamagami, and McArdle, 2009). Values for these two dummy variables are included in the table below; it should be noted that the combined sum of these two variables is slightly higher than the missing value for caregiving at each wave because, if the parent died in the two years since the last interview, questions about caregiving within those two years are still asked.

Table 3. Missing values by variable and wave. (n=3107)

	Wave 1	**Wave 2**	**Wave 3**	**Wave 4**	**Wave 5**	**Wave 6**
Respondent not present in wave	0	241 (7.76%)	327 (10.52%)	457 (14.71%)	560 (18.02%)	646 (20.79%)
Missing by death (cumulative)	0	27 (0.87%)	75 (2.41%)	120 (3.86%)	178 (5.72%)	250 (8.05%)
Missing by death (wave-to-wave attrition)	0	27 (0.87%)	48 (1.56%)	45 (1.48%)	55 (1.84%)	72 (2.46%)
Age	0	241	327	457	560	646
Race	0	-	-	-	-	-
Gender	0	-	-	-	-	-
Education	8	-	-	-	-	-
Health	0	242	330	458	562	647
Marital Status	3	245	332	459	560	646
Wealth	0	242	330	458	562	647
Income	0	242	330	458	562	647
Caregiving						
= missing	1	4	7	3	3	3
= n/a	0	292	739	1249	1644	2014
Dummy variables used to account for missingness						
All parents are deceased (0=deceased)	0	372 (13.17%)	787 (28.76%)	1094 (41.95%)	1373 (54.77%)	1583 (65.31)
Respondent not in wave (0=not in wave)	0	241 (7.76%)	327 (10.52%)	457 (14.71%)	560 (18.02%)	646 (20.79%)

Hypothesis testing. Latent trajectory analysis (LTA), or group-based modeling of development, is a semi-parametric approach that is particularly well suited to questions about how longitudinal trajectories differ among groups of cases (Nagin, 1999; Andruff, et al., 2009), and will therefore be applied to all research questions. LTA is performed with SAS ®, version 9.3 for Windows (SAS Institute, Cary, NC, 2012), using an application called PROC TRAJ, which is available from the Carnegie Mellon University website (Jones, 2012). Unlike standard growth modeling, which averages trajectories of individual cases to establish a typical pattern of change over time and then calculates the degree to which individual cases vary from the group mean, LTA is designed to group cases into several different patterns based on specified differences between groups (Nagin, 1999). This is particularly useful when the expectation is that between-group differences will result in trajectories of different shapes (Andruff, et al., 2009). For instance, for some hypotheses, it is expected that wealth will continue to accumulate

for some categories of caregivers, while at the same time wealth will decrease or remain flat for others. LTA is designed to be sensitive to such changes, while standard growth modeling techniques would average the groups and could potentially report insignificant findings as a result. Additionally, the method allows for testing of significance of quadratic and cubic terms when at least four observation points are available, which allows for analysis of groups for which assets may follow a complex, non-linear path. Group assignments are based on probabilities of group membership and should not, therefore, be interpreted as fixed or definite; however, post-hoc analyses can be performed to determine characteristics of the groups based on respondents' probable group membership.

Because of the heterogeneous and continuous nature of wealth's distribution across the population at each wave, tests of model fit with the group-based modeling approach can be misleading (Tyson Brown, personal communication, Dec. 6, 2012). PROC TRAJ assumes that the dependent variable's distribution is not normally distributed, but rather, that its distribution is best explained as homogenous within groups. Thus, PROC TRAJ requires users to specify the number of group being tested in each model, and as groups are added, the Bayesian Information Criterion (BIC) for the two models are compared to evaluate model fit. Modeling wealth using this technique can be difficult; although wealth is not normally distributed – and the distribution may be explained in part by natural groupings that can be estimated as a function of exogenous predictors – the "true" number of groups that explain the non-normal distribution may be quite large because of the large range and heterogeneity in the wealth measures. Therefore, adding groups to the model often produces better model fit even when the percentage of respondents assigned to each groups drops to a very small number. As a result, the BIC test may indicate that a model with N groups may fit the data better than a model with N-1 groups, even when only one

or two respondents fall into the Nth group. Therefore, model fit must be assessed both by comparing BIC scores and by making subjective decisions based on theory and the degree to which groups have enough cases to be substantively meaningful.

An example of the syntax used to estimate models for this study is provided in Figure 3, below. In this example, a three-group model is specified; the intercepts and linear, quadratic, and cubic slopes of the assets trajectories are estimated using the $\log_{10}$ transformation of wealth at each wave (LOGGASSETSx), which are modeled against a time-varying dummy variable, INTYEARx, which represents time. Caregiving status (ADLx), the response status dummy variable (INWx), and the parent mortality status dummy variable (WxPARENT), are included as time-varying covariates (TCOV) of assets, while gender (RAGENDER) is a time-invariant "risk factor" or exogenous predictor of the latent parameters. The ID variable points to the case number for each respondent, and the WEIGHT variable points to the individual-level weights in the first wave. (Using starting weights rather than ending weights allows for inclusion of respondents who dropout in later waves.) In the model statement, the censored normal distribution of the dependent variable is specified; zero-inflated Poisson or Bernoulli distributions are also supported in PROC TRAJ. The number of groups to be modeled is specified by NGROUPS, and the linear, quadratic, and cubic slopes to be estimated are specified in the ORDER statement. In this case, cubic slopes are tested for groups 1 and 2, but not for group 3. Though not shown here, start values for each of the parameters in the model can be specified in advance to facilitate model estimation.

Chapter 4. Results

Description of sample and results of univariate analyses. As shown in Table 4, application of inclusion criteria resulted in a sample size of 3107 respondents, of whom 65% (n=2019) were female. Ages ranged, per inclusion criteria, from 51 to 67, with a mean age of 57.12. Respondents' education ranged from 0 to 17 years, with a mean of 12.81 years and a median of 12 years. Roughly 75% (n=2326) of respondents were White/Non-Hispanic, while 15% (n=259) were African-American and 8% (n=454) were Hispanic; 68 respondents, or 2%, identified as another race. Approximately 18% (n=550) respondents reported excellent health at Wave 1, while just over 22% (n=694) reported fair or poor health. Three-fourths of respondents (n=2298, 74%) were married or partnered at baseline, while 713 (23%) were divorced or widowed and 93 (3%) were never married. Respondents had a mean adjusted income of $51,428 (median = $36,280) at baseline, with a range of $0 to $5,213,510. The mean adjusted wealth value at baseline was $251,767 (median = $103,562), with a range of -$2,390,849 to $20,976,253. A full summary of descriptive statistics at baseline is included in Table 4. Additionally, a chart depicting comparisons of both median and mean values of wealth (adjusted to 2008 dollars, divided by the number of household wage earners, and multiplied by sample weights) is shown in Figure 4. Caregivers and non-caregivers show remarkably similar wealth patterns when depicted in this way.

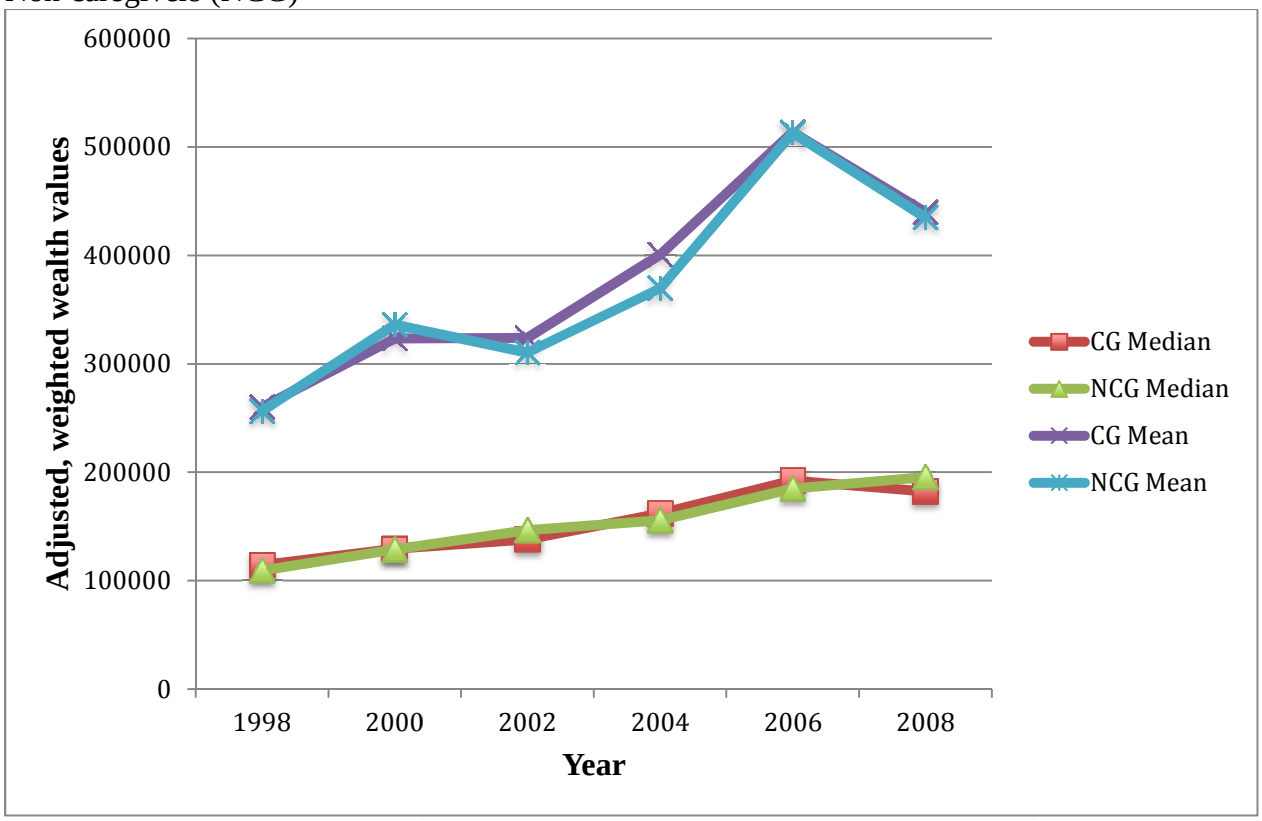
Because of the wide range and presence of extreme outliers in the dependent variable, additional analysis of the five highest and lowest cases was conducted. The values for wealth in these cases are consistent with values in prior and subsequent waves, and seem congruent with other data related to each case. Thus, these values are retained.

Table 4. Description of Sample at Baseline

	Wave 1	**Wave 2**	**Wave 3**	**Wave 4**	**Wave 5**	**Wave 6**
N=	3107	2866	2780	2650	2547	2461
Time-invariant covariates (frequencies)						
Gender	1088 (35% male) 2019 (65% female)					
Education (recoded)						
≥ 12 yrs.	1649 (53%)					
< 12 yrs.	1458 (47%)					
Race						
White =	2374 (81.47%)					
African-Am.=	409 (14.04%)					
Other =	131 (4.50%)					
Time-varying dependent variable (means, with standard deviations)						
Wealth (adjusted)	$233,978.33 (811,247.23)	$258,305.31 (754,185.05)	$258,483.16 (673,649.14)	$289,093.48 (971,340.11)	$347,664.79 (1,461,104.16)	$306,052.16 (845,946.16)
Wealth (log_{10})	4.48 (1.90)	4.54 (1.85)	4.55 (1.88)	4.47 (2.05)	4.50 (2.08)	4.54 (2.14)
Time-varying covariates (means/standard deviations, or frequencies)						
Age	60.82 (29-97; 5.61)	62.69 (31-99; 5.60)	64.59 (34-102; 5.56)	66.52 (37-104; 5.51)	68.46 (40-105; 5.45)	70.30 (39-107; 5.44)
Health						
Excellent	550 (18%)	517 (18%)	439 (16%)	372 (14%)	340 (13%)	252 (10%)
Very Good	970 (31%)	1001 (35%)	928 (33%)	823 (31%)	829 (33%)	778 (32%)
Good	893 (29%)	771 (27%)	816 (29%)	840 (32%)	773 (30%)	829 (34%)
Fair	488 (16%)	340 (12%)	424 (15%)	444 (17%)	420 (16%)	420 (17%)
Poor	206 (7%)	175 (6%)	170 (6%)	170 (6%)	183 (7%)	181 (7%)
Marital Status						
Married/ partnered	2298 (74%)	2104 (73%)	2006 (72%)	1891 (71%)	1793 (70%)	1670 (68%)
Divorced/ Widowed	713 (23%)	672 (23%)	697 (25%)	681 (26%)	686 (27%)	720 (29%)
Never married	93 (3%)	86 (3%)	76 (3%)	76 (3%)	68 (3%)	71 (3%)
Income (mean, adjusted)	$37,902.76 (81,000.94)	$38,067.46 (78,479.66)	$36,693.43 (83,884.68)	$39,461.70 (68,012.02)	$40,324.33 (181,663.51)	$40,787.29 (462,910.68)
Income (log_e)	10.05 (1.21)	10.04 (1.23)	10.03 (1.21)	10.59 (1.30)	10.06 (1.19)	10.03 (1.27)
Caregiving						
= n/a	0	292 (10%)	739 (26%)	1249 (45%)	1644 (65%)	2014 (82%)
= no	2914 (94%)	2041 (71%)	1266 (44%)	918 (33%)	690 (27%)	497 (20%)
= yes	0	553 (19%)	428 (15%)	407 (15%)	347 (14%)	289 (12%)

Care Intensity (# of hrs.)	0	5433 (5099)	5716 (4937)	5822 (5091)	6498 (5053)	6039 (4922)
Care Duration						
= 0	3107 (100%)	2819 (91%)	2597 (84%)	2438 (78%)	2328 (75%)	2234 (72%)
= 1	-	290 (9%)	448 (14%)	522 (17%)	574 (18%)	625 (20%)
= 2	-	-	62 (2%)	130 (4%)	147 (5%)	166 (5%)
= 3	-	-	-	17 (1%)	51 (2%)	62 (2%)
= 4	-	-	-	-	7 (0%)	18 (1%)
= 5	-	-	-	-	-	2 (0%)

Figure 3. Comparison of Weighted Wealth Values for Caregivers (CG) and Non-caregivers (NCG)



Analysis of all research questions was conducted using the PROC TRAJ procedure in SAS ® version 9.3 (SAS Institute, Inc., Cary, NC, 2012). Models were tested with specifications of 2, 3, 4, 5, and 6 groups. To refine these models, each was originally estimated with linear,

quadratic, and cubic terms along with the per-wave response indicator, the parent mortality status indicator, and the covariate(s) of interest. Parameters were evaluated for significance, and using the original model's start values, models were re-estimated without the non-significant cubic and quadratic terms. This process was continued until a model was identified in which all non-significant parameter estimates for the asset trajectory were eliminated, leaving only estimates for relevant trajectory terms and covariates, as well as all non-significant intercepts and linear parameters. BIC statistics for each of these final models were compared and model fit was assessed using a combination of these fit statistics and substantive significance of the groups identified. For the first question, all models are shown with an explanation how the best fitting model was selected. For subsequent hypotheses, only the best fitting model is presented and discussed; other models that were tested are included in Appendix A.

Research question 1. Does caregiving affect wealth trajectories?

Hypothesis 1.1: Caregiving will be significantly and negatively associated with wealth trajectories. This question was tested by modeling trajectories of wealth with the time-varying, dichotomous measure of caregiver status as a covariate. A summary of the model results is included in Tables 5-9. In each model, caregiving status is negatively associated with at least one group's trajectory, meaning that caregiving status has a negative impact on the overall trajectory of wealth. As the summary indicates, fit statistics continue to improve as groups are added to the model; however, the magnitude of the largest group remains relatively stable – with an overwhelming majority of respondents experiencing a relatively stable, flat trajectory of wealth over time. Thus, adding groups serves to split the remaining group of respondents into increasingly smaller groups, with each resulting group represented by a very different trajectory.

As predicted, the cubic term is significant with at least one, and often more, groups per model. In general, the cubic term was usually significant for the group in which caregiving was also significant, meaning that this group experiences more volatility in wealth over time than groups for which caregiving is not significant. This suggests that the hypothesis is supported, with caregiving having a significant and negative impact on wealth trajectories for at least a small percentage of respondents regardless of the number of groups specified.

It is interesting to note that in some of the models, parent mortality status is also significantly associated with the wealth trajectory of some groups. In a few cases, this significance occurs simultaneously with caregiving significance, such that the death of a parent is associated with a drop in wealth for groups where caregiving is also associated with a drop in wealth. For other groups, parent status has the opposite effect, such that the death of a parent is positively associated with wealth. It may be that for this group, the death of a parent results in a bequest that positively impacts the wealth trajectory.

Also of note is the fact that using a dummy variable to represent sample attrition causes the intercepts of most groups to be highly non-significant – in many cases, with $p \approx 1$. This occurs because the t-tests assess whether the mean for each group is significantly different from 0, and in groups with high attrition, the mean is likely to be close to 0. Therefore, despite the non-significance of the intercepts, the overall models and slope parameters may still be interpreted.

A model with four groups fit best, with the trajectory of Group 2 significantly impacted by caregiving status. Caregiving status was negatively associated with this group's trajectory, meaning that caregivers were likely to have a lower trajectory than noncaregivers in this group. Roughly 4.3% of respondents were assigned to this group based on confidence intervals.

Table 5. 2-group model

	Parameter	**β**	***S.E.***	***P***
Group 1	Intercept	2.24	58.04	.97
	Linear	0.11	0.12	.36
	Caregiving (Yes=1)	-1.78	0.61	.00
	Respondent in wave (Yes=1)	-1.17	58.01	.98
	Parent living (Yes=1)	-0.60	0.53	.26
Group 2	Intercept	5.40	1.93	.01
	Linear	0.15	0.03	.00
	Caregiving (Yes=1)	-0.02	0.00	.00
	Respondent in wave (Yes=1)	-0.51	0.65	.43
	Parent living (Yes=1)	-0.06	0.03	.06
	Sigma	1.38	0.04	.00

BIC = -23319.81 (N = 3092)

Table 6. 3-group model

	Parameter	**β**	***S.E.***	***p***
Group 1	Intercept	3.22	5.05	0.52
	Linear	-1.57	0.58	0.01
	Quadratic	0.18	0.09	0.04
	Caregiving	-1.85	0.56	0.00
	Respondent in wave	0.44	4.11	0.92
	Parent living	-0.24	0.81	0.77
Group 2	Intercept	-4.86	134.20	0.97
	Linear	13.98	1.18	0.00
	Quadratic	-3.45	0.38	0.00
	Cubic	0.27	0.04	0.00
	Caregiving	0.20	0.45	0.72
	Respondent in wave	-9.52	135.88	0.94
	Parent living	0.30	0.44	0.50
Group 3	Intercept	5.80	2.48	0.02
	Linear	0.07	0.02	0.00
	Quadratic	-0.01	0.00	0.05
	Caregiving	-0.02	0.04	0.71
	Respondent in wave	-0.74	3.39	0.83
	Parent living	-0.07	0.03	0.03
	Sigma	1.23	0.04	0.00

BIC = -22217.07 (N = 3092)

Table 7. 4-group model

	Parameter	**β**	***S.E.***	***p***
Group 1 (3.63%)	Intercept	-6.30	643.03	0.99
	Linear	14.58	14.58	0.00
	Quadratic	-3.61	-3.61	0.00
	Cubic	0.29	0.29	0.00

	Caregiving	0.17	0.55	0.76
	Respondent in wave	-8.72	643.94	0.99
	Parent living	0.42	0.45	0.35
Group 2 (4.28%)	Intercept	6.33	26.62	0.81
	Linear	-7.03	1.80	0.00
	Quadratic	2.26	0.59	0.00
	Cubic	-0.22	0.06	0.00
	Caregiving	-1.68	0.60	0.01
	Respondent in wave	2.42	28.05	0.93
	Parent living	-2.54	0.65	0.00
Group 3 (3.73%)	Intercept	0.67	1244.73	1.00
	Linear	6.28	2.44	0.01
	Quadratic	-2.71	0.82	0.00
	Cubic	0.30	0.08	0.00
	Caregiving	-0.51	0.50	0.31
	Respondent in wave	-4.74	1246.69	1.00
	Parent living	3.90	0.97	0.00
Group 4 (88.35%)	Intercept	5.96	192.22	0.98
	Linear	0.10	0.02	0.00
	Quadratic	-0.01	0.00	0.00
	Caregiving	0.00	0.04	0.98
	Respondent in wave	-0.95	192.21	1.00
	Parent living	-0.03	0.03	0.24
	Sigma	1.14	0.03	0.00

BIC = -23319.81 (N = 3092)

Table 8. 5-group model

	Parameter	**β**	**s.d.**	***p***
Group 1 (2.73%)	Intercept	0.76	187.10	1.00
	Linear	0.12	0.16	0.50
	Caregiving	-1.81	0.95	0.01
	Respondent in wave	-1.40	187.02	1.00
	Parent living	-0.74	0.88	0.43
Group 2 (3.46%)	Intercept	-5.62	151.99	0.97
	Linear	15.64	1.14	0.00
	Quadratic	-3.99	0.36	0.00
	Cubic	0.32	0.03	0.00
	Caregiving	-0.42	0.44	0.39
	Respondent in wave	-9.03	151.29	0.96
	Parent living	-0.32	0.27	0.24
Group 3 (87.36%)	Intercept	4.85	217.66	0.98
	Linear	0.08	0.02	0.00
	Quadratic	-0.01	0.00	0.20
	Caregiving	-0.00	0.04	0.88
	Respondent in wave	0.18	217.66	1.00
	Parent living	-0.02	0.03	0.35

Group 4 (2.75%)	Intercept	10.72	86.48	1.00
	Linear	-14.73	2.42	0.00
	Quadratic	5.10	0.76	0.00
	Cubic	-0.52	0.10	0.00
	Caregiving	-1.78	1.62	0.27
	Respondent in wave	4.81	4195.50	1.00
	Parent living	-1.61	0.85	0.06
Group 5 (3.70%)	Intercept	2.34	6528.09	1.00
	Linear	5.76	2.13	0.01
	Quadratic	-2.63	0.76	0.00
	Cubic	0.30	0.08	0.00
	Caregiving	-0.66	0.54	0.23
	Respondent in wave	-4.82	6526.67	1.00
	Parent living	2.90	1.10	0.01
	Sigma	1.08	0.03	0.00

BIC = -20948.13 (N = 3092)

Table 9. 6-group model

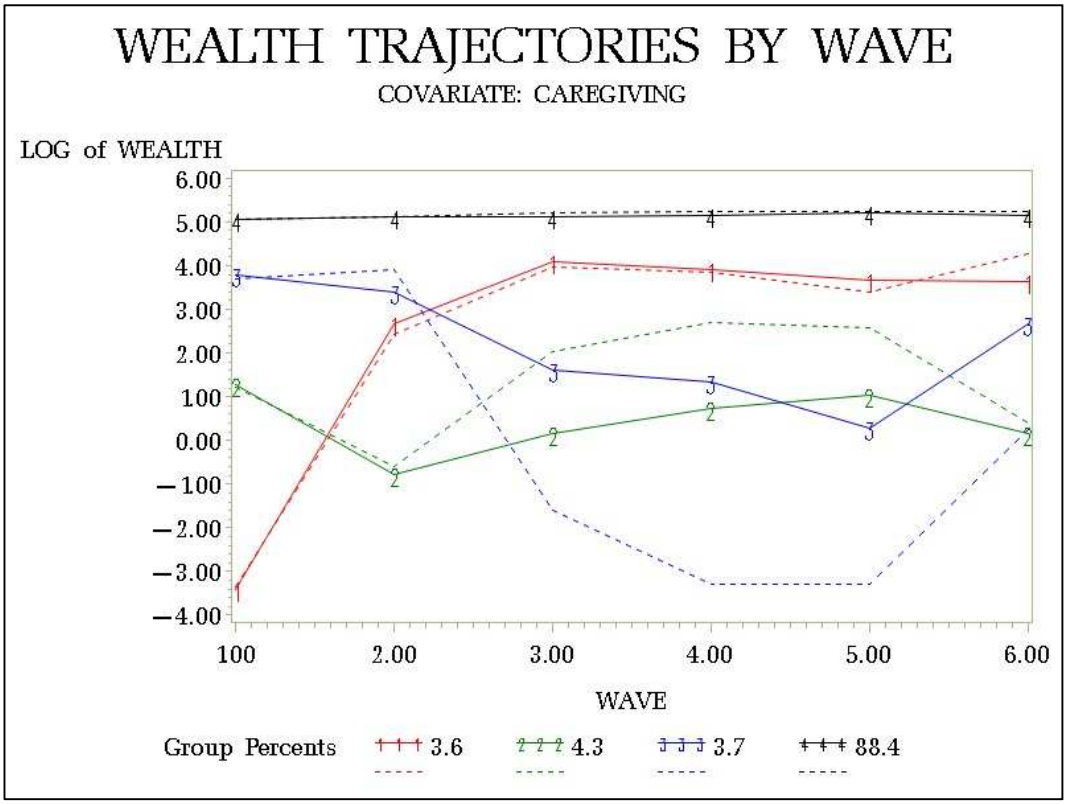
	Parameter	**β**	**s.d.**	***p***
Group 1 (2.70%)	Intercept		187.10	
	Linear		0.16	
	Caregiving		0.95	
	Respondent in wave		187.02	
	Parent living		0.88	
Group 2 (3.55%)	Intercept	-5.71	152.00	
	Linear	15.54	1.14	
	Quadratic	-3.99	0.36	
	Cubic	0.32	0.03	
	Caregiving	-0.31	0.44	
	Respondent in wave	-8.76	151.29	
	Parent living	-0.34	0.27	
Group 3 (86.76%)	Intercept	4.58	217.66	
	Linear	0.08	0.02	
	Quadratic	-0.01	0.00	
	Caregiving	0.00	0.04	
	Respondent in wave	0.45	217.67	
	Parent living	-0.02	0.03	
Group 4 (3.65%)	Intercept	9.00	86.48	
	Linear	-10.63	2.42	
	Quadratic	3.52	0.76	
	Cubic	-0.35	0.07	
	Caregiving	-0.11	2.09	
	Respondent in wave	3.80	84.81	
	Parent living	-1.41	1.03	
Group 5 (2.73%)	Intercept	0.19	16912.33	
	Linear	9.82	3.52	
	Quadratic	-4.07	1.16	

	Cubic	0.44	0.11	
	Caregiving	-0.51	0.75	
	Respondent in wave	-6.08	16908.82	
	Parent living	3.62	1.11	
Group 6 (0.60%)	Intercept	12.66	349.69	
	Linear	-9.93	0.95	
	Quadratic	1.72	0.16	
	Caregiving	-6.61	1.57	
	Respondent in wave	5.32	349.96	
	Parent living	-6.91	0.55	
	Sigma	1.06	0.03	

BIC = -20794.69 (N = 3092)

Because the size of groups continues to decrease below 3% when five or more groups are modeled, the 4-group model is deemed best, even when the BIC statistic improves with additional groups. A graph of the estimated trajectories that correspond with the four-group solution is provided in Figure 6. In the figure, the dashed lines indicate predicted trajectories, while the corresponding solid line shows the trajectory that best fits the observed measures. In general, as discussed above, intercepts are not significant. However, parameter estimates of the shape of the trajectories are significant, which suggests that while the starting points of the trajectories may not be predicted by these models, the overall shape of the trajectories, and the relationship of the covariates to the trajectories, can be interpreted.

Figure 4. Wealth trajectories with a 4-group model



Research question 2: Do caregivers' wealth trajectories vary by caregiver attributes?

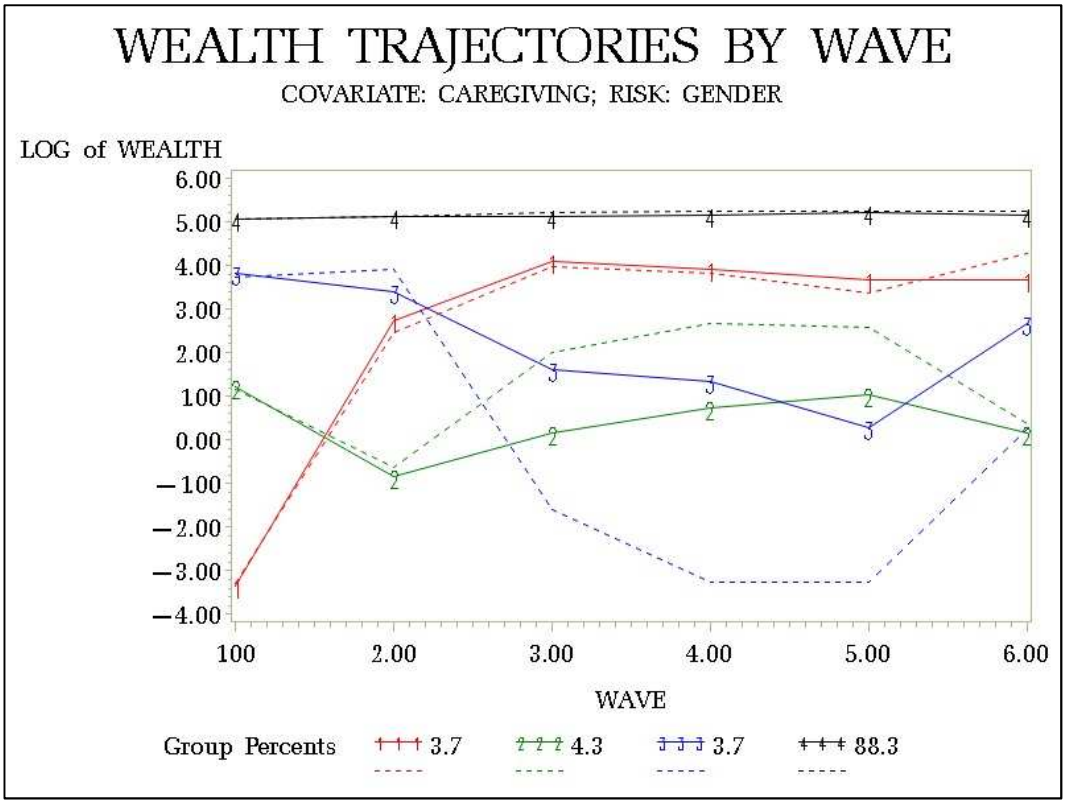
Hypothesis 2.1: Female caregivers will experience greater negative change in wealth trajectories over time than men. To test this hypothesis, gender was added to the previous model by identifying it as a time-invariant "risk" factor. Interestingly, gender was not a significant predictor of membership in any of the groups identified in the 4-group model. In fact, gender only emerged as a significant predictor for one group in the 5-group model, and not for any groups in the smaller models. This finding is contrary to findings in other studies on wealth and gender. Caregiving remains significantly and negatively related for one group in this model (β = -1.69, S.E.= 0.61, p=.01). Based on fit statistics and the size of groups in the larger models, a four-group solution is presented here.

Table 10. 4-group model with gender as risk factor

	Parameter	**β**	***S.E.***	***p***
Group 1 (3.7%)	Intercept	-6.29	527.45	0.99
	Linear	14.63	1.73	0.00
	Quadratic	-3.64	0.60	0.00
	Cubic	0.29	0.06	0.00
	Caregiving	0.17	0.54	0.76
	Respondent in wave	-8.71	528.49	0.99
	Parent living	0.44	0.46	0.34
Risk: Female	Constant	0.00	--	--
Group 2 (4.3%)	Intercept	6.30	30.24	0.84
	Linear	-7.04	2.00	0.00
	Quadratic	2.26	0.63	0.00
	Cubic	-0.22	0.06	0.00
	Caregiving	**-1.69**	**0.61**	**0.01**
	Respondent in wave	2.38	32.10	0.94
	Parent living	-2.52	0.77	0.00
Risk: Female	Constant	-1.17	0.91	0.20
	Gender	0.82	0.55	0.13
Group 3 (3.7%)	Intercept	0.74	111.43	0.99
	Linear	6.18	2.88	0.03
	Quadratic	-2.68	0.94	0.00
	Cubic	0.30	0.09	0.00
	Caregiving	-0.51	0.51	0.32
	Respondent in wave	-4.67	99.50	0.96
	Parent living	3.87	1.13	0.00
Risk: Female	Constant	-0.72	0.65	0.27
	Gender	0.47	0.38	0.22
Group 4 (88.3%)	Intercept	5.96	6.93	0.39
	Linear	0.10	0.02	0.00
	Quadratic	-0.01	0.00	0.00
	Caregiving	0.00	0.04	0.99
	Respondent in wave	-0.95	8.24	0.91
	Parent living	-0.03	0.03	0.25
Risk: Female	Constant	2.60	0.54	0.00
	Gender	0.37	0.34	0.27
	Sigma	1.14	0.03	0.00

BIC = -21505.10 (N = 3092)

Figure 5. Graph of trajectories in 4-group model with gender as risk factor.



Hypothesis 2.2: Race/ethnicity will significantly predict membership in groups for whom caregiving significantly and negatively impacts wealth trajectories. Similar to the models with gender, this hypothesis was tested by adding race as a risk factor. Models with the dichotomous measure of White/non-Hispanic vs. Other are presented here, although models with other dichotomous categorizations of race (African-American vs. Other, and Hispanic vs. Other) had similar findings. For all groups, race was significantly related; Whites were less likely to be members of group 2 (β = -1.10, S.E.= 0.34, p<.01) and group 3 (β = -0.83, S.E.= 0.35, p=.02), and more likely to be members of group 4 (β = -0.70, S.E.= 0.27, p=.01). Caregiving was also significantly and negatively associated with the wealth trajectory of group 2 (β = -1.67, S.E.= 0.60, p=.01), indicating that African-Americans and Hispanics were more likely to be members of the group for whom caregiving had a negative impact. Since group 4 is the group with the highest and most stable trajectory relative to the other groups, the finding that Whites are more

likely to be members of this group is also consistent with theory and findings in other studies. The graph of trajectories is not included here because the trajectories of all four groups are the same shape as in the chart presented for Hypothesis 2.1. See Figure 7.

Table 11. 4-group model with White/Non-Hispanic as risk factor

	Parameter	**β**	**S.E.**	***p***
Group 1 (3.6%)	Intercept	-6.32	3642.40	1.00
	Linear	14.60	1.30	0.00
	Quadratic	-3.61	0.44	0.00
	Cubic	0.27	0.04	0.00
	Caregiving	0.16	0.55	0.77
	Respondent in wave	-8.73	3638.26	1.00
	Parent living	0.42	0.45	0.35
Risk: White=1	Constant	0.00	--	--
Group 2 (4.3%)	Intercept	6.35	11.19	0.57
	Linear	-7.03	1.75	0.00
	Quadratic	2.25	0.58	0.00
	Cubic	-0.22	0.06	0.00
	Caregiving	**-1.67**	**0.60**	**0.01**
	Respondent in wave	2.44	12.04	0.84
	Parent living	-2.57	0.62	0.00
Risk: White=1	Constant	0.84	0.27	0.00
	Race	**-1.10**	**0.34**	**0.00**
Group 3 (3.8%)	Intercept	0.72	1649.76	1.00
	Linear	6.19	2.04	0.00
	Quadratic	-2.68	0.70	0.00
	Cubic	0.29	0.07	0.00
	Caregiving	-0.54	0.50	0.28
	Respondent in wave	-4.69	1648.34	1.00
	Parent living	3.85	0.90	0.00
Risk: White=1	Constant	0.58	0.29	0.04
	Race	**-0.83**	**0.35**	**0.02**
Group 4 (88.3%)	Intercept	5.96	47.29	0.90
	Linear	0.10	0.02	0.00
	Quadratic	-0.01	0.00	0.00
	Caregiving	-0.00	0.04	0.97
	Respondent in wave	-0.95	47.28	0.98
	Parent living	-0.03	0.03	0.21
Risk: White=1	Constant	2.64	0.23	0.00
	Race	**0.70**	**0.27**	**0.01**
	Sigma	1.14	0.03	0.00

BIC = -21441.72 (N = 3092)

Hypothesis 2.3: Education will significantly predict membership in groups for whom caregiving significantly and negatively impacts wealth trajectories. In order to assess the impact of education, the measure of a respondent's years of education was recoded as a time-invariant, categorical risk factor, with 0 signifying 12 years or less of education, and 1 indicating more than 12 years of education. The four-group model provided the best fit statistics while also producing groups that were large enough to be meaningful. Education was significantly and negatively related to membership in group 2 (β = -0.89, S.E.= 0.40, p=.03), indicating that those with more than a high school education were less likely to be members of this group. Group 2 was also the group for which caregiving was significantly and negatively related (β = -1.63, S.E.= 0.62, p=.01), which suggests that education may be protective against the negative impacts of caregiving on wealth trajectories. As with race, the graph of trajectories is not included here because the trajectories of all four groups are the same shape as in the chart presented for Hypothesis 2.1. See Figure 7 on page 62 for the relevant graph.

Table 12. 4-group model with education as risk factor.

	Parameter	**β**	**S.E.**	***p***
Group 1 (3.6%)	Intercept	-6.33	123.08	0.96
	Linear	14.64	1.53	0.00
	Quadratic	-3.63	0.52	0.00
	Cubic	0.29	0.05	0.00
	Caregiving	0.16	0.54	0.77
	Respondent in wave	-8.74	124.06	0.94
	Parent living	0.42	0.45	0.35
Risk: Education	Constant	0.00	--	--
Group 2 (4.3%)	Intercept	6.30	29.64	0.83
	Linear	-6.46	1.83	0.00
	Quadratic	1.99	0.61	0.00
	Cubic	-0.19	0.06	0.00
	Caregiving	**-1.63**	**0.62**	**0.01**
	Respondent in wave	2.39	30.83	0.94
	Parent living	-2.88	0.51	0.00
Risk: Education	Constant	0.49	0.23	0.03
	Education	**-0.89**	**0.40**	**0.03**
Group 3 (4.1%)	Intercept	1.11	1318.20	1.00
	Linear	3.24	2.84	0.25

	Quadratic	-1.47	1.12	0.19
	Cubic	0.16	0.12	0.20
	Caregiving	-0.29	0.80	0.72
	Respondent in wave	-4.30	1315.89	1.00
	Parent living	5.00	0.63	0.00
Risk: Education	Constant	0.32	0.28	0.26
	Education	-0.48	0.35	0.17
Group 4 (88.1%)	Intercept	5.96	4.29	0.16
	Linear	0.08	0.03	0.01
	Quadratic	-0.01	0.01	0.31
	Caregiving	-0.00	0.04	0.91
	Respondent in wave	-0.95	4.47	0.83
	Parent living	-0.02	0.03	0.47
Risk: Education	Constant	3.07	0.17	0.00
	Education	0.24	0.27	0.37
	Sigma	1.14	0.03	0.00

BIC = -21474.54 (N = 3092)

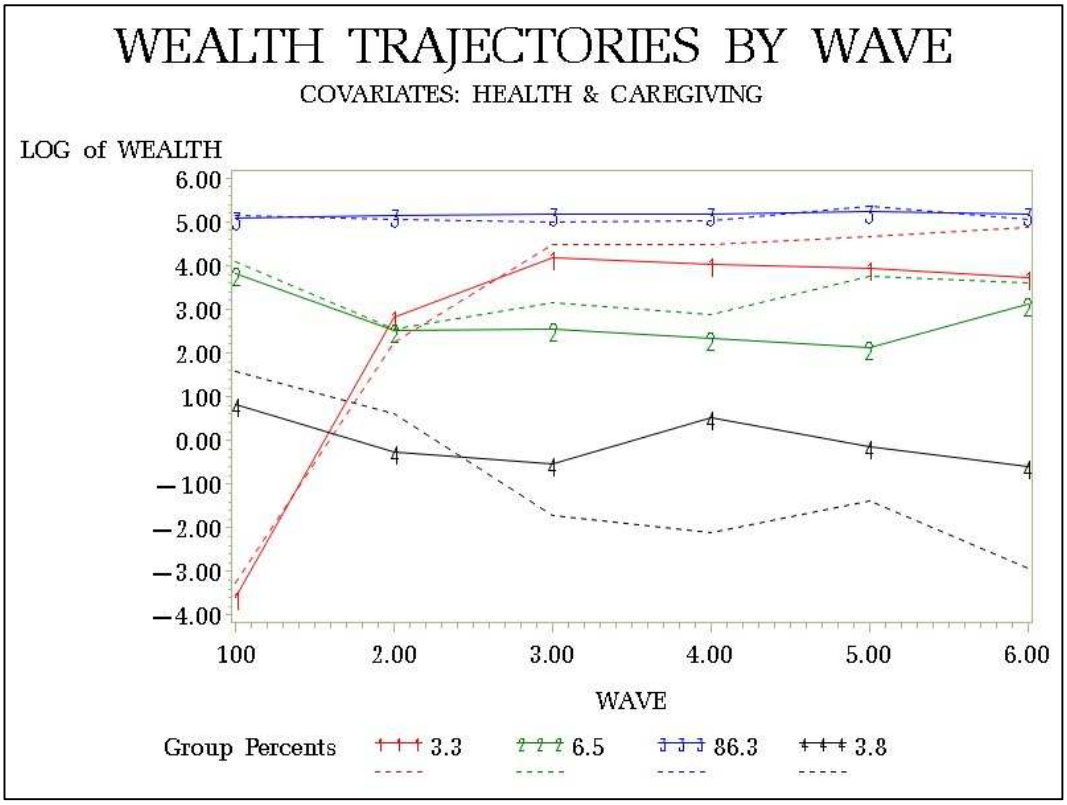
Hypothesis 2.4: Caregivers' health will be significantly and negatively associated with wealth trajectories in groups with whom caregiving is also significantly and negatively associated. Self-reported health, a time-varying, categorical measure, was added as a covariate to the models. As in the prior cases, the four-group model provided the best balance between maximizing fit statistics and maintaining large enough sizes. The graph of trajectories is provided in Figure 8, with a summary of statistics in Table 13. With health added into the model, there remains one group for whom caregiving is significant, and the relationship is negatively associated with the wealth trajectory ($\boldsymbol{\beta}$ = -1.95, S.E.= 0.53, p<.01). Health is significantly and negatively significant for this group as well ($\boldsymbol{\beta}$ = -0.58, S.E.= 0.22, p=.01), indicating that as health ratings decrease, wealth also decreases, and there may be a compounding effect between caregiving and health. Health is significantly and negatively related to all four groups, as expected.

Table 13. 4-group model with health as a covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (3.32%)	Intercept	-5.49	154.69	0.97
	Linear	12.41	1.50	0.00
	Quadratic	-3.51	0.49	0.00
	Cubic	0.28	0.05	0.00
	Caregiving	-0.10	0.62	0.87
	Health	**-0.29**	**0.14**	**0.04**
	Respondent in wave	-7.90	155.71	0.96
	Parent living	-0.45	0.47	0.33
Group 2 (6.54%)	Intercept	6.02	1.47	0.00
	Linear	-1.83	0.47	0.00
	Quadratic	0.22	0.07	0.00
	Caregiving	0.44	0.38	0.24
	Health	**-0.37**	**0.09**	**0.00**
	Respondent in wave	2.11	0.51	0.00
	Parent living	-1.69	0.39	0.00
Group 3 (86.31%)	Intercept	5.41	0.21	0.00
	Linear	0.10	0.01	0.00
	Quadratic	-0.01	0.00	0.00
	Caregiving	0.02	0.03	0.54
	Health	**-0.16**	**0.01**	**0.00**
	Respondent in wave	-0.01	0.22	0.98
	Parent living	-0.03	0.02	0.14
Group 4 (3.82%)	Intercept	4.37	16.27	0.79
	Linear	-0.41	0.16	0.01
	Caregiving	**-1.95**	**0.53**	**0.00**
	Health	**-0.58**	**0.22**	**0.01**
	Respondent in wave	-2.55	16.03	0.87
	Parent living	1.33	0.61	0.30
	Sigma	1.13	0.03	0.00

BIC = -21370.61 (N = 3092)

Figure 6. Graph of trajectories for 4-group health model.



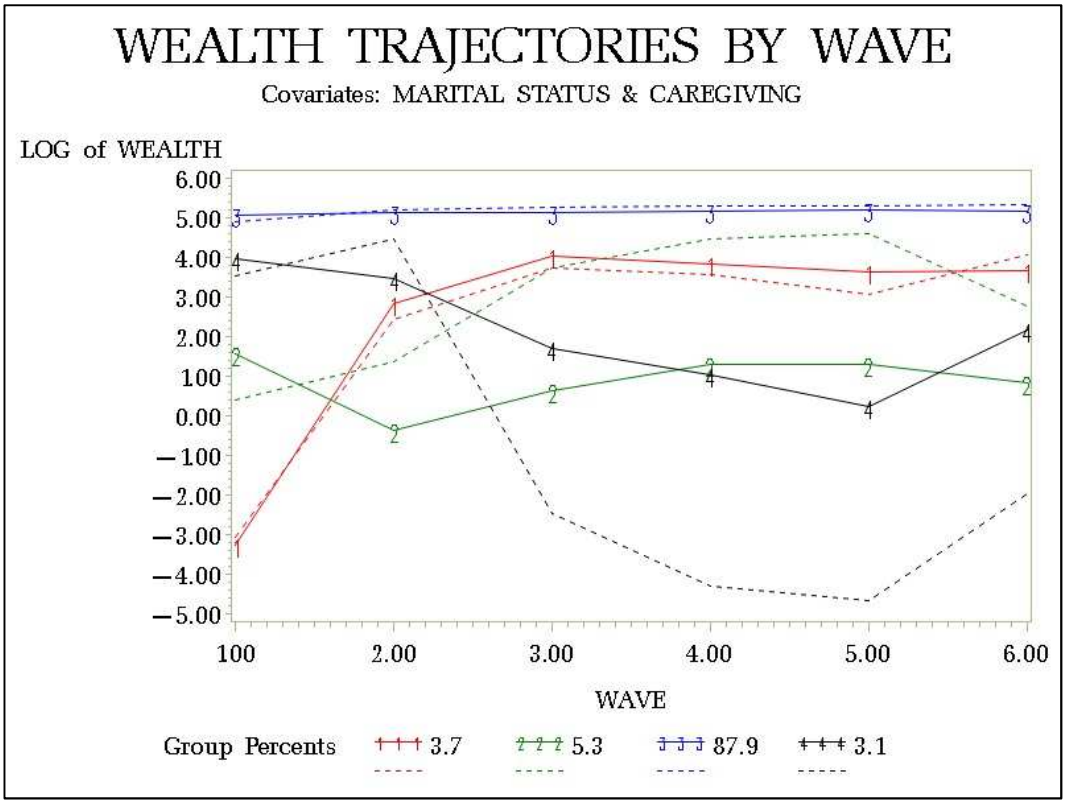
Hypothesis 2.5: Marital status will significantly predict membership in groups for whom caregiving significantly and negatively impacts wealth trajectories. Marital status was added to the model as a dichotomous measure in order to model changes in status over time; since categories of marital status are not ordinal, a more discriminating measure could not be incorporated into the model. As a result, all those who are single, regardless of previous marital history, are categorized together. When this dichotomous measure is added to the model, it is significantly and positively associated with the group trajectories of Group 2 (β = 2.69, S.E.= 0.33, p<.01), Group 3 (β = 0.24, S.E.= 0.05, p<.01), and Group 4 (β = 0.63, S.E.= 0.25, p=.01), indicating that being married is associated with higher asset trajectories than being divorced, widowed, or never married. At the same time, the significance of caregiving disappears from the four-group model (though the significance of caregiving re-emerges in the five-group model).

Table 14. 4-group model with marital status as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1	Intercept	-6.28	50.76	0.90
	Linear	14.73	1.14	0.00
	Quadratic	-3.69	0.36	0.00
	Cubic	0.30	0.03	0.00
	Caregiving	0.18	0.57	0.76
	Marital Status	-0.21	0.32	0.50
	Respondent in wave	-8.69	50.98	0.86
	Parent living	0.58	0.47	0.22
Group 2	Intercept	5.74	12.37	0.64
	Linear	-6.92	1.30	0.00
	Quadratic	2.21	0.55	0.00
	Cubic	-0.21	0.05	0.00
	Caregiving	-0.65	0.56	0.25
	Marital Status	**2.69**	**0.33**	**0.00**
	Respondent in wave	1.83	13.09	0.89
	Parent living	-2.23	0.50	0.00
Group 3	Intercept	5.14	4.93	0.30
	Linear	0.08	0.02	0.00
	Quadratic	-0.01	0.00	0.02
	Caregiving	0.02	0.03	0.52
	Marital Status	**0.24**	**0.05**	**0.00**
	Respondent in wave	-0.28	4.91	0.96
	Parent living	-0.04	0.03	0.17
Group 4	Intercept	0.67	1173.84	1.00
	Linear	6.13	2.14	0.00
	Quadratic	-2.60	0.78	0.00
	Cubic	0.28	0.08	0.00
	Caregiving	-0.53	0.47	0.26
	Marital Status	**0.63**	**0.25**	**0.01**
	Respondent in wave	-6.25	1173.36	1.00
	Parent living	5.31	0.59	0.00
	Sigma	1.12	0.03	0.00

BIC = -23319.81 (N = 3092)

Figure 7. Graph of trajectories for 4-group marital status model.



Modeling all covariates simultaneously

Findings from each of the models described above suggest that there may be some interactions between the effects of caregiving on wealth and the effects of other caregiver attributes such as race or health, at least for some caregivers. However, none of these models tests whether these effects remain consistent in the presence of other covariates. Since the life course perspective and findings from other studies suggest that there is some intersectionality – that the effects of multiple life experiences may combine and accumulate to create larger effects on wealth over time – it was important to estimate a model in which all covariates are present simultaneously. Therefore, a final model was built using age, health, marital status, income, and caregiving status as time-varying covariates, with race (modeling White/Non-Hispanic vs. Other), education, and gender as time-invariant risk factors. With all covariates included, a five-

group rather than four-group model fit best; parameters should be interpreted with caution, however, because eliminating cubic terms that were non-significant resulted in failed convergence. Results are presented in Table 15 and Figure 10, below. Although the parameter estimates may be somewhat unstable, they are consistent with findings from the models described above. For instance, caregiving remained significant and negatively associated with one group ($\boldsymbol{\beta}$ = -2.48, S.E.= 0.82, p<.01), and the size of that group (3.8%) was consistent with the models shown above. For this group, health was the only other covariate that was significantly associated, and the association, as expected, was negative ($\boldsymbol{\beta}$ = -0.94, S.E.= 0.31, p<.01). Race was also significant for this group, although the direction of the association changed: in this case, Whites were more likely to belong to the group for whom caregiving and health had a negative impact ($\boldsymbol{\beta}$ = 1.01, S.E.= 0.50, p=.04).

In order to more fully understand the characteristics of each group, post-hoc analysis was conducted using the probability estimates produced by the TRAJ procedure. These characteristics are summarized in Table 16. Group 4, the group for which caregiving status was significantly related to asset trajectories, had 104 respondents at baseline, with attrition of 22% (n=81 in 2008). The group had a mean age of 57.14 at baseline and mean education of 10.58 years. At all waves after the baseline wave, there were 8-10 people serving as caregivers (which was equivalent to 10% of group members in 2000, and nearly 20% in 2008). By that last wave, 75 members of this group had never been a caregiver, with 18 identifying as a caregiver once during the study, 7 identifying as a caregiver twice, and 4 members serving as a caregiver for 3 or more waves. This group displayed an interesting wealth pattern, with median wealth falling consistently across waves, but rising at the last wave. It may be that those who had the least wealth in the group were lost to attrition before the last wave.

Table 15. 5-group model

	Parameter	**β**	**s.d.**	***p***
Group 1 (3.7%)	Intercept	3.46	4943.33	1.00
	Linear	-11.32	4.37	0.01
	Quadratic	3.70	1.42	0.01
	Cubic	-0.34	0.13	0.01
	Age	**0.15**	**0.05**	**0.01**
	Health	-0.40	0.37	0.36
	Marital Status	**-1.96**	**0.51**	**0.00**
	Income	**0.37**	**0.17**	**0.03**
	Caregiving	-0.18	1.02	0.86
	Respondent in wave	1.30	4946.07	1.00
	Parent living	**-2.87**	**0.62**	**0.00**
Risk Factors	Constant	0.00	--	--
Group 2 (3.1%)	Intercept	-2.58	1489.30	1.00
	Linear	15.61	1.13	0.00
	Quadratic	-3.78	0.37	0.00
	Cubic	0.30	0.03	0.00
	Age	**-0.11**	**0.04**	**0.00**
	Health	**-0.23**	**0.12**	**0.06**
	Marital Status	0.20	0.19	0.29
	Income	-0.06	0.09	0.50
	Caregiving	0.12	0.60	0.84
	Respondent in wave	-6.00	1487.88	1.00
	Parent living	0.02	0.37	0.96
Risk Factors	Constant	-0.10	0.73	0.89
	Race	**1.27**	**0.40**	**0.00**
	Education	0.17	0.57	0.77
	Gender	-0.46	0.47	0.32
Group 3 (86.7%)	Intercept	3.94	623.50	1.00
	Linear	-0.08	0.05	0.13
	Quadratic	0.04	0.02	0.02
	Cubic	-0.00	0.00	0.01
	Age	**0.01**	**0.00**	**0.00**
	Health	**-0.12**	**0.01**	**0.00**
	Marital Status	**-0.11**	**0.04**	**0.00**
	Income	**0.15**	**0.01**	**0.00**
	Caregiving	0.03	0.03	0.26
	Respondent in wave	-0.72	623.50	1.00
	Parent living	-0.03	0.02	0.14
Risk Factors	Constant	-0.46	0.86	0.60
	Race	**1.01**	**0.50**	**0.00**
	Education	0.19	0.89	0.35
	Gender	-0.18	0.60	0.57
Group 4 (3.8%)	Intercept	5.19	459.45	0.99
	Linear	-4.57	2.94	0.12
	Quadratic	1.70	1.03	0.10
	Cubic	-0.19	0.11	0.07
	Age	0.01	0.05	0.76
	Health	**-0.94**	**0.31**	**0.00**

	Marital Status	+0.63	0.40	0.11
	Income	0.10	0.09	0.27
	Caregiving	**-2.48**	**0.82**	**0.00**
	Respondent in wave	-0.72	462.83	1.00
	Parent living	3.88	0.83	0.00
Risk Factors	Constant	-0.46	0.86	0.60
	Race	**1.01**	**0.50**	**0.04**
	Education	0.19	0.89	0.83
	Gender	-0.18	0.60	0.76
Group 5 (2.7%)	Intercept	2.66	11923.62	1.00
	Linear	9.23	1.68	0.00
	Quadratic	-3.59	0.55	0.00
	Cubic	0.37	0.05	0.00
	Age	-0.01	0.06	0.81
	Health	-0.12	0.17	0.49
	Marital Status	**-0.67**	**0.27**	**0.02**
	Income	0.17	0.09	0.08
	Caregiving	0.14	0.44	0.75
	Respondent in wave	-4.50	11925.18	1.00
	Parent living	-0.47	0.50	0.34
Risk Factors	Constant	1.03	0.77	0.18
	Race	0.04	0.41	0.93
	Education	-0.30	0.65	0.65
	Gender	-0.44	0.52	0.39
	Sigma	1.03	0.03	0.00

BIC = -20353.59 (N = 3089)

Figure 8. Graph of trajectories for 5-group model.

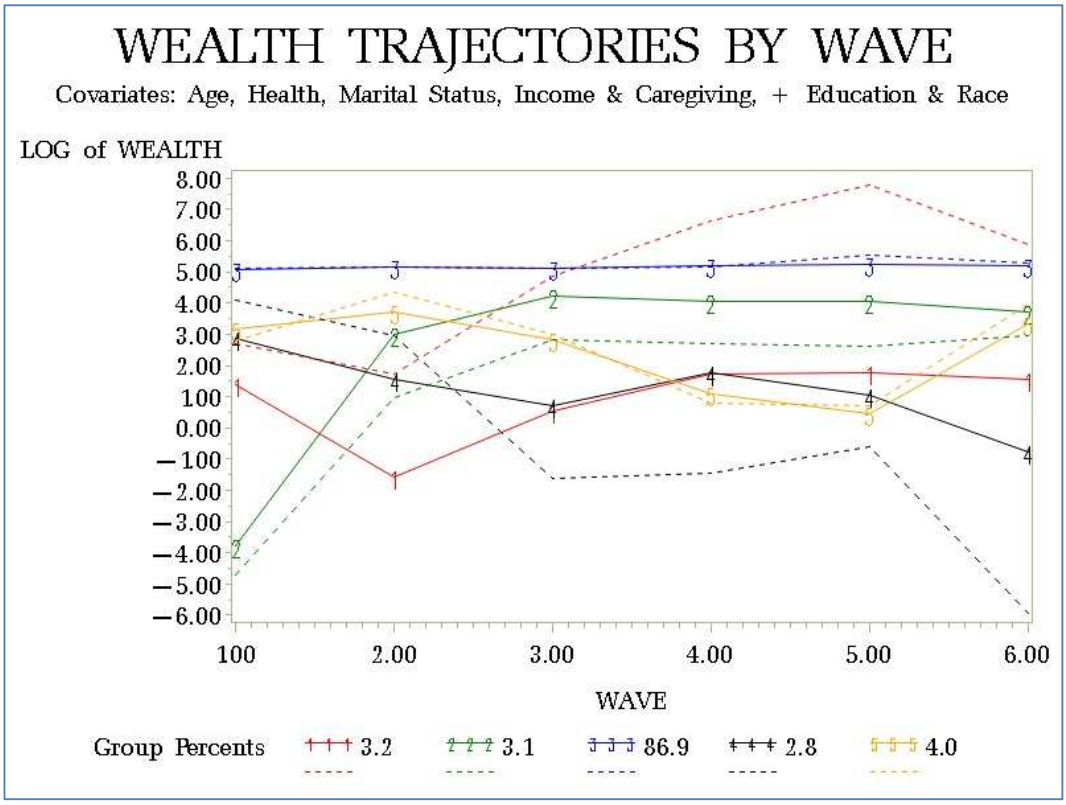


Table 16. Comparing characteristics of group in the 5-group summary model (all values are at baseline except care duration, which reflects duration in final wave)

	Group 1	**Group 2**	**Group 3**	**Group 4**	**Group 5**
N	80	84	2691	104	133
Attrition by final wave	18 (22.5)	18 (21.4)	547 (20.3)	23 (22.1)	31 (23.3)
Gender	F=55 (68.8), M=25 (31.3)	F=52 (61.9), M=32 (38.1)	F=1746 (64.9) M=945 (35.1)	F=66 (63.5), M=38 (36.5)	F=91 (68.4), M=42 (31.6)
Race					
White =	42 (52.5)	54 (64.3) *	2132 (79.2) *	42 (40.4) *	49 (36.8)
African-Am.=	27 (33.8)	21 (25.0)	313 (11.6)	33 (31.7)	55 (41.4)
Other =	11 (13.8)	9 (10.7)	246 (9.1)	29 (27.9)	29 (21.8)
Age	56.6 (4.0) *	57.1 (4.0) *	57.1 (4.2) *	57.1 (4.1)	57.4 (4.1)
Education (recoded)	11.57 (3.2)	11.9 (3.3)	13.1 (2.8)	10.6 (4.1)	10.8 (3.4)
Health					
Excellent	4 (5.0)	10 (11.9) *	515 (19.1) *	11 (10.6) *	10 (7.5)
Very Good	17 (21.2)	16 (19.1)	897 (33.3)	16 (15.4)	23 (17.3)
Good	22 (27.5)	28 (33.3)	778 (28.9)	30 (28.9)	31 (23.3)
Fair	21 (26.3)	19 (22.6)	380 (14.1)	19 (18.3)	42 (31.6)
Poor	16 (20.0)	11 (13.1)	121 (4.5)	28 (26.9)	27 (20.3)
Marital Status					
Married/partnered	35 (43.8) *	45 (53.6)	2104 (78.3) *	48 (46.2)	59 (44.4) *
Divorced/ Widowed	39 (48.8)	35 (41.7)	519 (19.3)	47 (45.2)	68 (51.1)
Never married	6 (7.5)	3 (4.8)	65 (2.4)	9 (8.7)	6 (4.5)
Income (mean)	$19,948 * (17,879)	$96,068 (566,263)	$53,703 * (64,323)	20,900 (25,541)	21,974 * (23,949)

Wealth (mean)	$34,965 (91,543)	-$51,226 (260,623)	289,076 (693,611)	29,462 (49,520)	13,694 (49,369)
Care Duration					
= 0	54 (67.5)	73 (86.9)	1920 (71.4)	75 (72.1) *	101 (75.9)
= 1	20 (25.0)	9 (10.7)	554 (20.6)	18 (17.3)	22 (16.5)
= 2	4 (5.0)	2 (2.4)	146 (5.4)	7 (6.7)	6 (4.5)
= 3	2 (2.5)	0	53 (2)	2 (1.9)	4 (3.0)
= 4	0	0	17 (0.6)	1 (1)	0
= 5	0	0	1 (0.0)	1 (1)	0

* = parameter estimate was significant (α =.05)

Research Question 3: How do the duration and intensity of the caregiving experience impact caregivers' wealth trajectories?

Hypothesis 3.1: Duration of the informal caregiving experience is associated with a larger depressing effect on caregivers' wealth trajectories over time. To test this hypothesis, a model was fit with care duration included as a time-varying covariate. For this question, analysis was limited to the population of respondents who became caregivers at some point during the study (n=869). Prior models indicated that becoming a caregiver was significantly and negatively associated with wealth, so excluding those who never became caregivers removed the initial effect of the jump from noncaregiver to caregiver. (Sensitivity testing with models that included all respondents confirms that care duration is significant for some groups when those who never become caregivers are included. Please see Appendix A for these results.) The sample was limited to those who had identified as a caregiver at least once, and because sample attrition was not a significant factor for this group, the dummy variable for respondent status was dropped. The dummy variable for parent mortality was retained, however, because of its relationship to eligibility to become a caregiver at any given wave.

For all models using care duration as a covariate, care duration is not significant. As in other models, the four-group model is determined to fit the data best; group membership occurs in similar percentages as prior models, with a large majority (87%) belonging to a group with

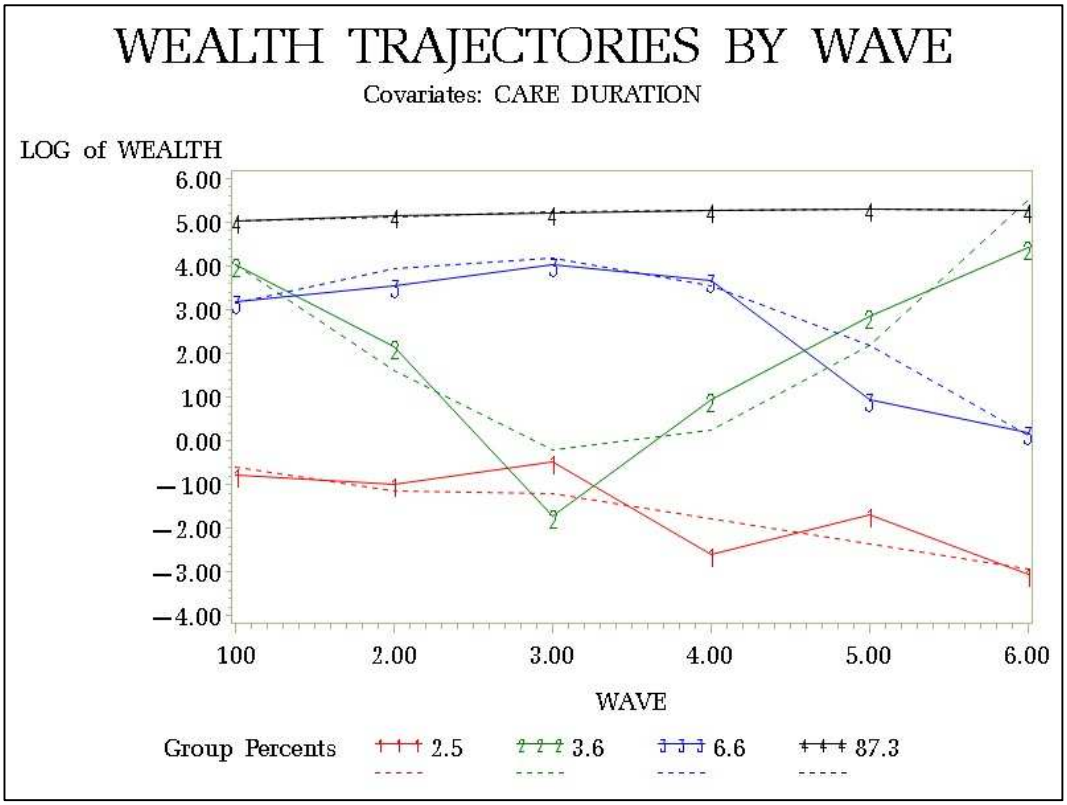
relatively stable wealth over time. Neither in-wave status nor parent mortality status is significantly related to any trajectories. Also, it should be noted that the cubic term was not significant for any groups in this model, whereas the models that include non-caregivers (and that have at least one group for whom caregiving is negatively related to asset trajectories) do have significant cubic parameters in the caregiving group. This may indicate that the initial jump to caregiving status is where much of the impact on wealth occurs.

Table 17. 4-group model with care duration as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (2.54%)	Intercept	-0.02	0.46	0.97
	Linear	-0.57	0.17	0.00
	Care duration	0.52	0.42	0.22
	Parent living	0.00	0.71	1.00
Group 2 (3.61%)	Intercept	8.12	1.16	0.00
	Linear	-4.54	0.76	0.00
	Quadratic	0.72	0.10	0.00
	Care duration	-1.16	0.73	0.11
	Parent living	-0.28	0.62	0.65
Group 3 (6.56%)	Intercept	2.35	1.20	0.05
	Linear	1.87	0.87	0..03
	Quadratic	-0.36	0.11	0.00
	Care duration	-0.57	0.47	0.22
	Parent living	-0.72	0.47	0.13
Group 4 (87.28%)	Intercept	4.93	0.09	0.00
	Linear	0.14	0.04	0.00
	Quadratic	-0.01	0.00	0.00
	Care duration	0.02	0.04	0.62
	Parent living	-0.03	0.04	0.47
	Sigma	1.20	0.06	0.00

BIC = -29561.41 (N = 869)

Figure 9. Graph of trajectories for 4-group model of care duration.



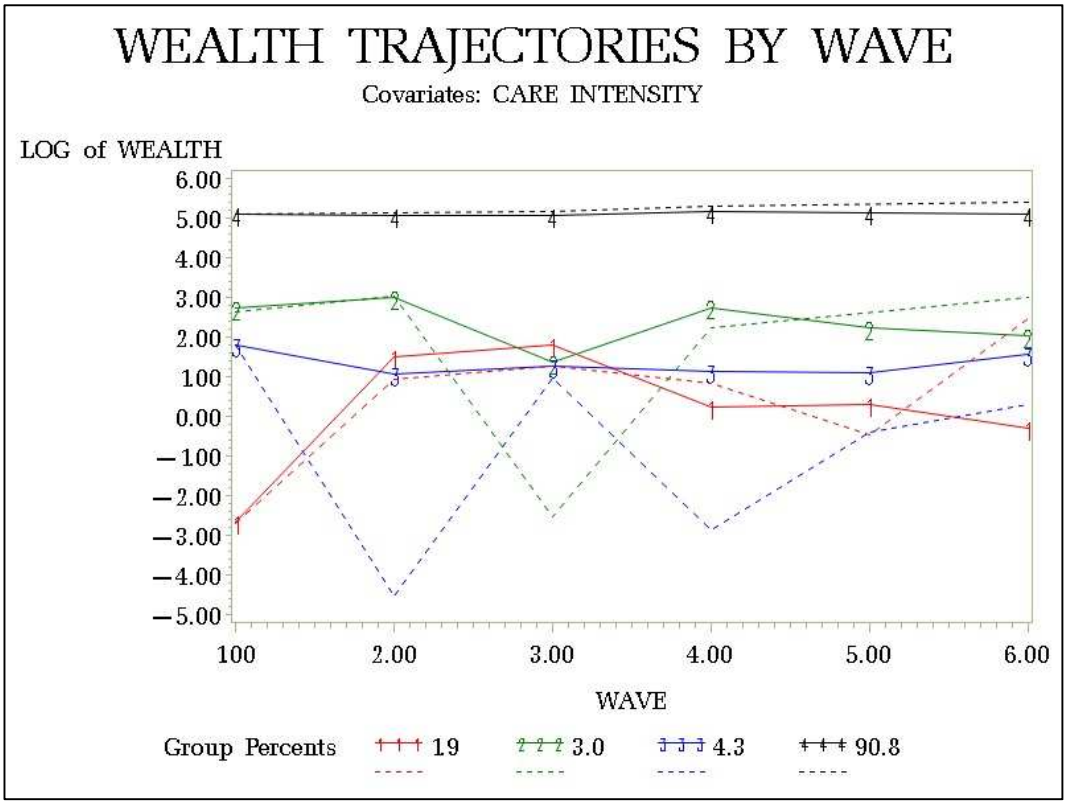
Hypothesis 3.2: Intensity of the caregiving experience is associated with larger negative effect on caregivers' wealth trajectories over time. To test this hypothesis, a measure of caregiving hours at each wave was included as a time-varying covariate. As with the analysis of care duration, the sample was limited to those who had identified as a caregiver at least once during the study period (n-869), and the in-wave dummy variable was dropped. The hours of care measure was significantly associated with two groups, but in opposite directions. In Group 2, the relationship was negative, indicating that as hours of care increased, asset trajectories were negatively affected (β = -0.00, S.E.= 0.00, p<.01). In Group 3, the opposite effect was seen: care hours were positively associated with asset trajectories, indicating that trajectories increased as hours increased. In both cases, however, the parameter estimate was extremely small, however, and as the trajectory graph indicates, the slopes were quite volatile. Therefore, despite the statistical significance, the substantive impact of care hours may be negligible.

Table 18. 4-group model with hours of care as co-variate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (1.94%)	Intercept	-10.41	2.96	0.00
	Linear	15.80	2.65	0.00
	Quadratic	-5.20	0.81	0.00
	Cubic	0.49	0.08	0.00
	Care hours	-0.00	0.00	0.15
	Parent living	-3.36	0.66	0.00
Group 2 (2.96%)	Intercept	0.69	0.68	0.31
	Linear	0.39	0.20	0.05
	Care hours	**-0.00**	**0.00**	**0.00**
	Parent living	1.57	0.64	0.01
Group 3 (4.35%)	Intercept	16.59	2.76	0.00
	Linear	-18.42	2.68	0.00
	Quadratic	4.94	0.87	0.00
	Cubic	-0.39	0.09	0.00
	Care hours	**0.00**	**0.00**	**0.00**
	Parent living	-0.92	0.66	0.17
Group 4 (90.76%)	Intercept	5.10	0.06	0.00
	Linear	0.05	0.01	0.00
	Care hours	-0.00	0.00	0.13
	Parent living	-0.06	0.05	0.27
	Sigma	0.93	0.05	0.00

BIC = -11342.04 (N = 869)

Figure 10. Graph of trajectories for 4-group model of care intensity.



Summary of Findings

Taken together, findings present mixed support for the study hypotheses. These findings are summarized in Table 19. Hypothesis 1.1 is partly supported, with at least some caregivers experiencing lower wealth trajectories when compared with non-caregivers. Hypotheses 2.2, 2.3, 2.4 and 2.5 are moderately supported, in that caregiving is negatively associated with wealth trajectories for at least one group in each model. By contrast, hypothesis 2.1 was not supported, since gender was not significantly associated with wealth trajectories for any groups. Similarly, hypotheses 3.1 and 3.2 were not supported; care duration was not significantly related to wealth trajectories when wealth among caregivers was analyzed, and while care hours were, the direction of impact was mixed and the effect on trajectories was quite small.

Table 19. Summary of findings, by hypothesis

Hypothesis	Relationship tested	Finding
1.1	Caregiving will be significantly and negatively associated with wealth trajectories.	**Partly Supported**: caregiving status negatively associated with one wealth trajectory group, representing 4.3% of respondents.
Research Question 2		
2.1	Female caregivers will experience greater negative change in wealth trajectories over time than men.	**Unsupported**: gender is not statistically associated with any trajectory groups.
2.2	Race/ethnicity will significantly predict membership in groups for whom caregiving significantly and negatively impacts wealth trajectories.	**Supported**: Race was negatively associated with the trajectory group for whom caregiving had a negative impact on asset trajectories, meaning that African-Americans were more likely than Whites to be members of this group.
2.3	Education will significantly predict membership in groups for whom caregiving significantly and negatively impacts wealth trajectories.	**Supported**: Education was negatively associated with the trajectory group for whom caregiving had a negative impact on wealth trajectories, meaning that those with lower education were more likely to be in this group.
2.4	Caregivers' health will be significantly and negatively associated with wealth trajectories in groups for whom caregiving is also significantly and negatively associated.	**Supported**: Health was negatively associated with all trajectory groups, including that for whom caregiving status was also negatively associated, meaning that poorer health had a negative effect on wealth trajectories.
2.5	Marital status will significantly predict membership in groups for whom caregiving significantly and negatively impacts wealth trajectories.	**Unsupported**: Being married was positively associated with some wealth trajectories, but significance of caregiving status disappears from most models.
Research Question 3		
3.1	Duration of the informal caregiving experience is associated with a larger negative effect on caregivers' wealth trajectories over time.	**Unsupported**: Care duration was not significantly associated with any trajectory groups.
3.2	Intensity of the caregiving experience is associated with larger negative effect on caregivers' wealth trajectories over time.	**Mixed**: Care intensity was significantly associated with two trajectory groups, but in different directions, and the parameter estimate was very close to 0 in both cases.

Chapter 5. Discussion

Any analysis of the economic impacts of caregiving comes with challenges. A number of decisions were made in the course of this analysis, with the goal of creating models that were both testable and parsimonious. However, most decisions require trade-offs. Therefore, a few limitations to this study, both conceptual and methodological, should be noted.

Limitations

One conceptual limitation is related to the choice of wealth instead of income as the dependent variable of interest. As several cross-sectional studies have suggested (AARP, 2012), caregiving may have substantial direct impacts on the income of caregivers who were working full-time before they assumed the caregiving role. It may be that for some caregivers, especially those in lower income brackets, the decreases in income do not directly result in decreased wealth, because income is not used heavily for savings. There may be some impact from decreases in Social Security contributions, but since contributions to Social Security are not included in the wealth measures in the HRS, the impact of decreased Social Security contributions on retirement preparation does not emerge in this study. Income trajectories present their own challenges, since income may fluctuate significantly from month to month and year to year, and may not, therefore, follow a statistically perceptible trajectory. Also, in the age range of interest in this study, some respondents may choose to retire for reasons other than caregiving, and teasing out the effects of caregiving on income in the presence of both “normal” and caregiving-motivated retirement presents some interesting challenges. Nonetheless, choosing to focus on wealth may have resulted in leaving some of the negative impacts of caregiving undetected, especially among lower-income respondents.

A related issue is that differences in income status may impact differences in the balance of informal and formal care provided to the care recipient. For instance, some low-income care recipients may qualify for Medicaid services, and some high-income care recipients may be able to pay for home care on their own. As a result, the demand for caregivers' time may be highest among families in the middle – and therefore these caregivers may feel the most physical, emotional, and financial strain. On the other hand, some evidence suggests that even when formal services are provided to LTC recipients, either as private pay or with public assistance, the amount of time spent on informal care remains constant or decreases very slightly (Pezzin, Kemper, & Reschovky, 1996). Although the impact on caregivers' expenses is not certain, it may be that informal care expenses, similar to informal care time, are relatively invariant even when formal services are provided through public funds. The question of whether the presence of formal care services mitigates the financial impact of caregiving is not addressed in the present study, but is an important area for future investigation.

Another conceptual consideration is that this dataset is limited to adults over the age of 50, which limits generalizability of the study because the median age of caregivers in the U.S. is roughly 49. It may be that younger caregivers experience different economic impacts from caregiving, especially because they may have more earning years ahead of them, but they also may be more likely to be "sandwiched" caregivers, who are providing care for both a parent and a child or children. The HRS is uniquely suited to this type of longitudinal analysis of household wealth because of the number of waves of data and the length of participation by respondents, but it limits generalizability to caregivers who are over age 50. A related limitation is the restriction of analysis to those providing care for a parent. Many caregivers in this age range provide care for a spouse; analysis of their finances is more difficult, however, because income

and wealth are measured at the household level and may include income and wealth of the care recipient as a result. Therefore, this study limits analysis to caregivers for parents, with the understanding that generalizability is limited as a result.

The method of measuring caregiving also presents a limitation in this dataset. First, the measure captures all who have provided 100 hours or more of care for a parent over the last two years; this may include those who only provided two hours of care per week for an entire year, as well as those who were full-time caregivers for only a few weeks. The measure of intensity attempts to capture some of this nuance; however, models that use the caregiver status measure or the duration measure may dilute some of the effects of caregiving on assets because they may include those who have not been caregivers for very long, or who have not had a very intense caregiving experience. A related issue is that the caregiving measures ask only about care provided to a parent or stepparent, not care provided to a parent-in-law. This may miss some important impacts of caregiving for those who are not caring for their own parents, but are caring for their spouse/partner's parent. Interestingly, caregiving for parents-in-law is measured in 1998 and 2000, but not in subsequent waves. As a result, these data are excluded from this study, but may have indirect impacts. In 1998, there were 455 people who were providing ADL and/or IADL care for a parent-in-law, but not for their own parents. These caregivers were included in the original sample of non-caregivers because they do not fit the narrow definition of caregiving used here; however, they may have been experiencing impacts on assets from their caregiving experience, and so they may have a small but confounding effect on the models. Similarly, there may be respondents in other waves who are caregivers for parents-in-law, and who may have lower asset totals as a result, thereby confounding these findings and potentially creating a type II error.

There is also an important methodological limitation to note: because of the wide range of net worth values and the continuous distribution of net worth values across the population, there is a great deal of heterogeneity in both starting values for wealth and trajectory shapes. The group-based growth curve approach imposes a homogeneity assumption on the intercepts of each group, meaning that it assumes that the starting values for the trajectories will be roughly the same within groups, while differing between groups. Applying this assumption frees enough parameters to be able to test cubic terms in the trajectories, but it causes some difficulty in assessing model fit, as is discussed above. Despite this limitation, the method was chosen because it allows for analysis of the cubic terms of the trajectories; nonetheless, future work should test these models using an approach that frees the intercepts within groups to determine whether probability of group membership is affected by the equality constraints.

Lastly, a number of measures used in this study, including the caregiving status measure, are only measured every two years; therefore, some nuances of the caregiving experience may be lost in this analysis. Similarly, some measures, such as marital status, had to be recoded into dichotomous variables in order to be included as covariates. As a result, some nuances of the respondents' experiences, such as potential differences in effect of caregiving on those who are widowed versus those who were never married, may be missed.

Discussion

In general, hypotheses about the effect of caregiving on respondents' assets were supported. For most groups, and with most covariates, caregiving status was negatively associated with at least one group's trajectory. The size of the group varied based on the number of groups identified in the model, but regardless of the number of groups, caregiving was always

significant for at least one. This offers support for the hypothesis that caregiving has a negative impact on asset trajectories. At the same time, in every model, caregiving was only significantly associated with a small group. Size of the group varied from 10% to under 3%, depending on the number of groups identified. This suggests that while it is an important factor for some, for a majority of people, caring for a parent does not have a significant impact on wealth over time.

Findings about the role of caregiver characteristics – specifically, race and health – are generally consistent with the literature. Being single, African-American or Hispanic, and having a high school education or less were all associated with membership in the group for whom caregiving had a negative impact on wealth, suggesting that members of already vulnerable groups are more likely to experience negative impacts from caregiving over time. Being in poor health was negatively and significantly associated with wealth trajectories for most groups, suggesting that it has an important impact on wealth regardless of other factors. It is notable that the effect remains present for the group that is negatively impacted by the caregiving experience, since caregivers are more likely to experience poor health than noncaregivers. This suggests that while poor health does not completely explain the negative impact of caregiving on wealth trajectories, it may compound the effect.

The findings on gender are not consistent with the larger body of literature on the gender gap in wealth. In the models presented here, gender is only statistically significant for one small group (2.7%) in the five-group model, and is not statistically significant for any groups in other models. The findings do not directly refute other studies, however, because the models only compare likelihoods of belonging to one wealth trajectory group versus another; they do not directly compare wealth trajectories of women versus those of men. It may be that the gender effects are consistent across models, and thus, that no one group is distinguished from the others

in terms of membership of females. Dividing wealth by the number of people in the household may dilute some of the gender effects if women who are married or partnered have more wealth than those who were not part of a couple. Lastly, some of the gender gap may be accounted for by the significance of the caregiving status variable, since a majority of caregivers in this sample are women.

It is also important to note that when marital status is added to the model without other covariates, the negative effects of caregiving disappear. This indicates that marital status may have special importance in understanding potential long-term economic impacts of caregiving. In particular, since women who are widowed are more likely to live in poverty, and women in general are more likely to be caregivers, more analysis is needed to understand whether there is an interaction between marital status and caregiving in relation to long-term wealth trajectories. These relationships were not fully explored in this study, because those who were divorced, widowed, and single were combined into one category. Future work should focus more directly on the interactions of gender, marital status, and caregiving status and their potential cumulative impacts on assets.

Implications

Although conclusions from this study must be drawn with caution, the consistency of the findings across models offers support for the hypothesis that providing care for an aging parent has negative impacts on some wealth trajectories; however, the findings are clear that caregiving only has negative impacts for *a small group*. Further, the findings support the hypotheses that unmarried people, ethnic/racial minority populations, and people in poor health are most vulnerable to these impacts. These dynamics are important to acknowledge, especially as our

country's LTC system continues to increase its reliance on informal caregivers to provide not just occasional care, but also assistance with ADLs and complex medical tasks. This study suggests that while a majority of people providing care to an aging parent may not experience long-term impacts on their wealth, a minority may have lower wealth trajectories as a result of their caregiving experience – and this negative impact may compound existing vulnerabilities to financial insecurity. In short, some caregivers may need additional financial support, either during the caregiving experience, or later in life when their savings come up short as they face their own retirement and LTC needs.

These findings are particularly important at this point in the ongoing policy conversation about long-term care coverage in the U.S. In fact, very recently, the 112th Congress repealed the CLASS Act as part of the American Taxpayer Relief Act (Pub. L. 112-240). Advocates had viewed CLASS as a promising first attempt to enact a national, long-term care insurance program (Advance CLASS, 2013). The CLASS program had been written into the Affordable Care Act in 2010, but implementation of the program had been scrapped by the HHS in 2012 because the statutory requirements of the program, as written by Congress, made the program very unlikely to remain viable. Congress moved to repeal the Act rather than making the legislative changes necessary to facilitate implementation, but in exchange, a new Commission on Long-Term Care was created. This Commission is likely to return a report similar to its 1990 counterpart, the Pepper Commission, since the facts surrounding our country's long-term care system remain largely the same, with the exception that more is known now about the impact of informal caregiving on families.

The present study offers partial confirmation and partial challenge to the findings of cross-sectional studies on the impact of caregiving on caregivers' finances. When examined

longitudinally, it appears that caregiving for an aging parent does not always negatively impact caregivers' wealth trajectories; importantly, however, it does negatively impact *some* – and especially those who are already vulnerable to financial insecurity. Policymakers continue to be concerned about the increase in demand on public programs such as Medicaid and Social Security's Supplemental Security Income (SSI), and yet increasing reliance on informal caregivers may, inadvertently, increase the number of people who will need these programs later because they lost opportunities to save for their own retirement and LTC needs while serving as caregivers. As the new Commission on Long-Term Care gets to work, the hope is that this new information about the long-term financial impacts of caregiving will influence decisions about how to support vulnerable caregivers as they perform a service that is valuable to society and critical to the long-term care system as it is currently structured.

The study also offers an important methodological contribution to the study of the economic impacts of caregiving. Previous work has focused mostly on cross-sectional analysis and has not always used nationally representative samples. Applying latent growth curve analysis to wealth data and using 10 years' of data to begin to explore the long-term effects of caregiving are important innovations – and yield the interesting finding that the impacts of caregiving for an aging parent are far more complex than previous research has indicated.

Directions for Future Research

This study fills an important gap in our knowledge about the economic impacts of informal caregiving, but there is more work to be done. In fact, several looming questions emerge from the findings. First, since wealth accumulation is a life-long process, even a study that examines 10 years of data is inadequate to fully document wealth trajectories across the life

course. Because questions about caregiving were inconsistent in the HRS until 1998, the length of time included in this analysis was necessarily limited; as future waves of data are collected however, it may be possible to build an even clearer picture of the natural patterns of wealth development through the later half of life among HRS respondents. Additionally, it may be that other data sets, which include younger respondents, may provide opportunities to track trajectories across the entire life course, and thereby to put the impacts of caregiving into a more complete context.

Second, this study explores the economic impact of caregiving specifically on informal caregivers who provide care for a parent. Research is needed to understand the impacts of caregiving on those who care for a spouse, in particular because widows are particularly vulnerable to poverty in general. It may be that those who are widowed after an extended caregiving experience may be even more vulnerable and in need of extra financial support.

Third, more work is needed to understand the impact of caregiving on income trajectories and on household spending. Some of the caregivers in this sample had very low income, and low or negative net worth, and for these respondents, impacts on income may not have translated into lower wealth trajectories. Rather, caregiving may have impacts by limiting the amount of money available to these caregivers for their own household expenses. Thus, further study of the impact of caregiving on income across the population is needed, especially because impacts on income may have direct impacts on Social Security contributions. Since Social Security is the primary source of retirement income for an increasing number of older adults, any decrease in Social Security savings could have long-term negative consequences. Additionally, future analysis should include exploration of how household spending differs among caregivers and non-caregivers.

Lastly, future work is needed to explore the intersectionality of caregiving with the race and gender gaps in both income and wealth. This study suggests that race may be a risk factor for negative impacts of caregiving on wealth, but the findings on gender are less clear. Further study of these interactions is needed. Women and people of color are more likely to have low incomes and low wealth, and so the impacts of caregiving may not be completely captured by this study. Future research should examine the impacts of caregiving on income, especially among women and people of color.

Conclusion

Over the last decade, a significant shift in LTC service delivery has prioritized community care over institutionalization. This shift is popular with care recipients and state policy makers, but is placing increasing pressure on families who are tasked with increasingly complex care responsibilities. This study lends support to those who are concerned that providing informal care – in this case, to an aging parent – may have negative impacts on some caregivers, not just in terms of the physical and emotional toll, but also by placing them at greater risk for financial insecurity by lowering their ability to accumulate wealth over time. Although most caregivers will not experience sustained negative financial impacts, some caregivers are particularly vulnerable. Social workers and policy makers should remember that unpaid care is not necessarily free, and that special attention to vulnerable caregivers should include consideration of their household financial situation.

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Appendix A. Model statistics for alternate models tested

Hypothesis 2.1: Female caregivers will experience greater negative change in wealth trajectories over time than men.

Table 20. 3-group model with gender as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (89.70%)	Intercept	5.83	1.13	0.0000
	Linear	0.02	0.01	0.1191
	Caregiving (Yes=1)	-0.01	0.04	0.8104
	Respondent in wave (Yes=1)	-0.70	0.49	0.1532
	Parent living (Yes=1)	-0.08	0.03	0.0280
Group 2 (3.90%)	Intercept	-4.99	110.49	0.9639
	Linear	13.94	1.16	0.0000**
	Quadratic	-3.45	0.38	0.0000**
	Cubic	0.27	0.04	0.0000**
	Caregiving (Yes=1)	0.21	0.54	0.7038
	Respondent in wave (Yes=1)	-9.32	109.57	0.9322
	Parent living (Yes=1)	0.31	0.44	0.4789
	Gender (Female=1)	-0.30	0.25	0.2288
Group 3 (6.40%)	Intercept	13.56	0.88	0.0000
	Linear	-1.57	0.58	0.0070
	Quadratic	0.18	0.09	0.0436
	Caregiving (Yes=1)	-1.84	0.56	0.0011**
	Respondent in wave (Yes=1)	-9.93	1.85	0.0000**
	Parent living (Yes=1)	-0.20	0.81	0.8009
	Gender (Female=1)	0.33	0.20	0.1020
	Sigma (variance explained by model)	1.23	0.04	0.0000**

BIC=-22203.56 (N=3092)

Table 21. 5-group model with gender as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (3.5%)	Intercept	-5.61	156.11	0.9713
	Linear	**15.62**	**1.22**	**0.0000****
	Quadratic	**-3.98**	**0.38**	**0.0000****
	Cubic	**0.32**	**0.03**	**0.0000****
	Caregiving	-0.41	0.50	0.4104
	Respondent in wave	-9.03	155.21	0.9536
	Parent living	-0.31	0.28	0.2630
Group 2 (2.7%)	Intercept	0.77	1066.70	0.9994
	Linear	0.11	0.18	0.5371
	Caregiving	**-1.76**	**0.75**	**0.0183***
	Respondent in wave	-1.39	1066.80	0.9990

	Parent living	-0.74	0.95	0.4328
	Gender	**1.18**	**0.41**	**0.0042****
Group 3 (87.4%)	Intercept	4.85	12.11	0.6891
	Linear	**0.08**	**0.02**	**0.0000****
	Quadratic	**-0.01**	**0.00**	**0.0217****
	Caregiving	-0.00	0.03	0.8869
	Respondent in wave	0.18	12.11	0.9878
	Parent living	-0.02	0.02	0.3512
	Gender	**0.44**	**0.25**	**0.0810***
Group 4 (2.7%)	Intercept	10.78	1386.41	0.9938
	Linear	**-14.84**	**4.29**	**0.0005****
	Quadratic	**5.13**	**1.44**	**0.0004****
	Cubic	**-0.52**	**0.14**	**0.0001****
	Caregiving	-1.78	1.80	0.3496
	Respondent in wave	4.87	1383.25	0.9972
	Parent living	-1.62	0.90	0.0711*
	Gender	0.53	0.38	0.1687
Group 5 (3.7%)	Intercept	2.34	4556.91	0.9996
	Linear	**5.78**	**2.26**	**0.0106****
	Quadratic	**-2.64**	**0.81**	**0.0011****
	Cubic	**0.30**	**0.08**	**0.0002****
	Caregiving	-0.65	0.58	0.2618
	Respondent in wave	-4.82	4558.39	0.9992
	Parent living	**2.88**	**1.28**	**0.0240****
	Gender	0.53	0.38	0.1687
	Sigma	1.08	0.03	0.0000

BIC = -20957.12 (N = 3092)

Hypothesis 2.2: Race/ethnicity will significantly predict membership in groups for whom caregiving significantly and negatively impacts wealth trajectories.

Table 22. 3-group model with race as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (89.5%)	Intercept	5.80	1.24	0.0000
	Linear	**0.07**	**0.02**	**0.0009****
	Quadratic	**-0.01**	**0.00**	**0.0458****
	Caregiving	-0.02	0.04	0.6720
	Respondent in wave	-0.74	1.22	0.5465
	Parent living	-0.07	0.03	0.0212**
Group 2 (6.7%)	Intercept	3.21	30.50	0.9162
	Linear	**-1.55**	**0.54**	**0.0038****
	Quadratic	**0.18**	**0.08**	**0.0290****
	Caregiving	**-1.87**	**0.53**	**0.0038****
	Respondent in wave	0.42	24.82	0.9864
	Parent living	-0.20	0.72	0.7807
	Race (White/Non-	**-1.78**	**0.19**	**0.0000****

	Hispanic=1)			
Group 3 (3.8%)	Intercept	-4.92	87.23	0.9550
	Linear	**14.09**	**1.16**	**0.0000****
	Quadratic	**-3.48**	**0.37**	**0.0000****
	Cubic	**0.28**	**0.04**	**0.0000****
	Caregiving	0.21	0.55	0.7034
	Respondent in wave	-9.58	86.75	0.9120
	Parent living	0.31	0.45	0.4903
	Race (White/Non-Hispanic=1)	**-0.84**	**0.28**	**0.0025****
	Sigma	1.23	0.04	0.0000

BIC = -22142.44 (N=3092)

Table 23. 5-group model with race as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (3.5%)	Intercept	-5.63	46.89	0.9044
	Linear	**15.64**	**1.22**	**0.0000****
	Quadratic	**-3.99**	**0.38**	**0.0000****
	Cubic	**0.32**	**0.03**	**0.0000****
	Caregiving	-0.33	0.45	0.4617
	Respondent in wave	-9.04	46.49	0.8458
	Parent living	-0.30	0.27	0.2702
Group 2 (2.7%)	Intercept	0.66	158.82	0.9967
	Linear	0.09	0.16	0.5718
	Caregiving	**-1.38**	**0.59**	**0.0193****
	Respondent in wave	-1.50	158.51	0.9924
	Parent living	-0.47	1.05	0.6522
	Race	**-1.22**	**0.40**	**0.0024****
Group 3 (87.1%)	Intercept	4.85	24.55	0.8435
	Linear	**0.08**	**0.02**	**0.0000****
	Quadratic	**-0.01**	**0.00**	**0.0178****
	Caregiving	-0.00	0.03	0.9274
	Respondent in wave	0.19	24.57	0.9940
	Parent living	-0.02	0.02	0.5081
	Race	**0.87**	**0.30**	**0.0037****
Group 4 (3.6%)	Intercept	10.75	1721.18	0.9950
	Linear	**-13.39**	**2.18**	**0.0000****
	Quadratic	**4.34**	**0.75**	**0.0000****
	Cubic	**-0.42**	**0.08**	**0.0000****
	Caregiving	-0.50	1.61	0.7547
	Respondent in wave	4.84	1722.94	0.9978
	Parent living	**-2.32**	**0.69**	**0.0008****
	Race	-0.52	0.44	0.2403
Group 5 (3.2%)	Intercept	0.62	398.84	0.9988
	Linear	**8.98**	**1.45**	**0.0000****
	Quadratic	**-3.67**	**0.56**	**0.0000****
	Cubic	**0.39**	**0.06**	**0.0000****

	Caregiving	-0.47	0.61	0.4348
	Respondent in wave	-6.54	399.37	0.9869
	Parent living	**4.01**	**0.89**	**0.0000****
	Race	-0.62	0.47	0.1911
	Sigma	1.08	0.03	0.0000**

BIC = -20865.86 (N = 3092)

Hypothesis 2.3: Education will significantly predict membership in groups for whom caregiving significantly and negatively impacts wealth trajectories.

Table 24. 3-group model with education as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (89.6%)	Intercept	5.80	0.86	0.0000
	Linear	**0.07**	**0.02**	**0.0010****
	Quadratic	**-0.01**	**0.00**	**0.0493****
	Caregiving	-0.01	0.04	0.7392
	Respondent in wave	-0.74	0.89	0.4100
	Parent living	-0.07	0.03	0.0372
Group 2 (6.6%)	Intercept	3.20	2.81	0.2556
	Linear	**-1.52**	**0.54**	**0.0048****
	Quadratic	**0.17**	**0.08**	**0.0362****
	Caregiving	**-1.83**	**0.57**	**0.0014****
	Respondent in wave	0.41	2.35	0.8614
	Parent living	-0.20	0.75	0.7877
	Education			
Group 3 (3.8%)	Intercept	-4.89	120.58	0.9677
	Linear	**14.03**	**1.15**	**0.0000****
	Quadratic	**-3.47**	**0.38**	**0.0000****
	Cubic	**0.28**	**0.04**	**0.0000****
	Caregiving	0.21	0.55	0.7019
	Respondent in wave	-9.55	119.97	0.9366
	Parent living	0.30	0.45	0.4966
	Education			
	Sigma	1.23	0.04	0.0000

BIC -22188.56 (N=3092)

Table 25. 5-group model with education as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (3.5%)	Intercept	-5.62	148.80	0.9699
	Linear	**15.63**	**1.22**	**0.0000****
	Quadratic	**-3.98**	**0.38**	**0.0000****
	Cubic	**0.32**	**0.03**	**0.0000****
	Caregiving	-0.43	0.50	0.3873
	Respondent in wave	-9.03	147.91	0.9513
	Parent living	-0.31	0.27	0.2479
	Education			

Group 2 (2.8%)	Intercept	0.78	248.34	0.9975
	Linear	0.12	0.17	0.4971
	Caregiving	**-1.84**	**0.82**	**0.0249****
	Respondent in wave	-1.38	248.39	0.9956
	Parent living	-0.78	0.85	0.3570
	Education	**-0.94**	**0.41**	**0.0222****
Group 3 (87.3%)	Intercept	4.85	109.21	0.9646
	Linear	**0.08**	**0.02**	**0.0000****
	Quadratic	**-0.01**	**0.00**	**0.0137****
	Caregiving	-0.01	0.03	0.8499
	Respondent in wave	0.19	109.21	0.9986
	Parent living	-0.02	0.02	0.3186
	Education	0.41	0.26	0.1197
Group 4 (2.7%)	Intercept	10.79	6279.82	0.9986
	Linear	**-14.82**	**4.45**	**0.0009****
	Quadratic	**-0.01**	**0.00**	**0.0137****
	Cubic	**-0.52**	**0.14**	**0.0002****
	Caregiving	-1.82	1.62	0.2633
	Respondent in wave	4.88	6283.50	0.9994
	Parent living	**-1.65**	**0.84**	**0.0501***
	Education	0.11	0.53	0.8395
Group 5 (3.8%)	Intercept	2.42	3115.66	0.9994
	Linear	**5.61**	**1.98**	**0.0046****
	Quadratic	**-2.57**	**0.71**	**0.0003****
	Cubic	**0.29**	**0.07**	**0.0000****
	Caregiving	-0.69	0.53	0.1910
	Respondent in wave	-4.74	3114.32	0.9988
	Parent living	**2.83**	**1.20**	**0.0182****
	Education	-0.41	0.40	0.3002
	Sigma	1.08	0.03	0.0000

BIC = -20939.56 (N = 3092)

Hypothesis 2.4: Caregivers' health will be significantly and negatively associated with wealth trajectories in groups for whom caregiving is also significantly and negatively associated.

Table 26. 3-group model with health as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (3.71%)	Intercept	-5.41	26.15	0.8360
	Linear	**13.50**	**1.26**	**0.0000****
	Quadratic	**-3.26**	**0.42**	**0.0000****
	Cubic	**0.26**	**0.04**	**0.0000****
	Caregiving	0.14	0.69	0.8411
	Health (Excellent=1; Poor=5)	**-0.35**	**0.11**	**0.0019****
	Respondent in wave	-8.20	26.08	0.7532

	Parent living	0.66	0.57	0.2406
Group 2 (89.24%)	Intercept	5.09	11.99	0.6712
	Linear	**0.08**	**0.02**	**0.0001****
	Quadratic	**-0.01**	**0.00**	**0.0208****
	Caregiving	0.01	0.04	0.7886
	Health (Excellent=1; Poor=5)	**-0.19**	**0.01**	**0.0000****
	Respondent in wave	0.43	16.86	0.9798
	Parent living	**-0.07**	**0.03**	**0.0065****
Group 3 (7.05%)	Intercept	6.21	7.07	0.3798
	Linear	**-1.65**	**0.42**	**0.0001****
	Quadratic	**0.20**	**0.42**	**0.0027****
	Caregiving	**-2.00**	**0.62**	**0.0009****
	Health (Excellent=1; Poor=5)	**-0.53**	**0.15**	**0.0003****
	Respondent in wave	-0.33	7.02	0.9624
	Parent living	-0.43	0.60	0.4711
	Sigma	1.21	0.04	0.0000**

BIC = -21972.37 (N=3092)

Table 27. 5-group model with health as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (2.15%)	Intercept	0.43	0.00	0.9967
	Linear	**0.39**	**2.62**	**0.0088 ****
	Caregiving	**-2.54**	**-4.11**	**0.0000 ****
	Health	-0.30	-1.69	0.0903 *
	Respondent in wave	-1.73	-0.02	0.9881
	Parent living	0.39	0.55	0.5845
Group 2 (3.31%)	Intercept	-5.36	32.61	0.8694
	Linear	**15.44**	**1.21**	**0.0000 ****
	Quadratic	**-3.87**	**0.39**	**0.0000 ****
	Cubic	**0.31**	**0.04**	**0.0000 ****
	Caregiving	-0.49	0.45	0.2832
	Health	-0.20	0.11	0.0804 *
	Respondent in wave	-8.77	32.00	0.7840
	Parent living	-0.44	0.25	0.0794 *
Group 3 (4.16%)	Intercept	2.88	52.42	0.9562
	Linear	**-1.17**	**0.40**	**0.0032 ****
	Quadratic	**0.13**	**0.07**	**0.0497 ****
	Caregiving	-0.01	0.62	0.9909
	Health	**-0.38**	**0.10**	**0.0001 ****
	Respondent in wave	-1.78	52.98	0.9732
	Parent living	**5.09**	**0.71**	**0.0000 ****
Group 4 (87.10%)	Intercept	5.67	20.03	0.9562
	Linear	**0.08**	**0.01**	**0.0000 ****
	Quadratic	**-0.01**	**0.00**	**0.0070 ****
	Caregiving	-0.03	0.03	0.3132

	Health	**-0.17**	**0.01**	**0.0000 ****
	Respondent in wave	-0.4	19.80	0.9902
	Parent living	-0.02	0.02	0.3408
Group 5 (3.28%)	Intercept	9.23	4.84	0.0569
	Linear	**-2.43**	**0.65**	**0.0002 ****
	Quadratic	**0.24**	**0.10**	**0.0159 ****
	Caregiving	-1.31	1.62	0.4238
	Health	**-0.50**	**0.20**	**0.0153 ****
	Respondent in wave	2.06	5.49	0.7071
	Parent living	**-4.54**	**1.05**	**0.0000 ****
	Sigma	1.08	0.03	0.0000 **

BIC = -20905.44 (N = 3092)

Hypothesis 2.5: Marital status will significantly predict membership in groups for whom caregiving significantly and negatively impacts wealth trajectories.

Table 28. 3-group model with marital status as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (3.70%)	Intercept	-5.93	585.51	0.9919
	Linear	**13.98**	**1.28**	**0.0000****
	Quadratic	**-3.41**	**0.42**	**0.0000****
	Cubic	**0.27**	**0.04**	**0.0000****
	Caregiving	0.22	0.59	0.7087
	Marital Status	-0.02	0.31	0.9586
	Respondent in wave	-8.71	584.60	0.9881
	Parent living	0.42	0.43	0.3285
Group 2 (7.19%)	Intercept	3.69	9.13	0.6858
	Linear	**-1.61**	**0.37**	**0.0000****
	Quadratic	**0.20**	**0.06**	**0.0005****
	Caregiving	-1.15	0.60	0.0545
	Marital Status	**2.13**	**0.29**	**0.0000****
	Respondent in wave	-0.97	8.82	0.9134
	Parent living	-0.01	0.54	0.9796
Group 3 (89.11%)	Intercept	5.69	18.17	0.7543
	Linear	**0.08**	**0.02**	**0.0000****
	Quadratic	**-0.01**	**0.00**	**0.0080****
	Caregiving	0.01	0.04	0.7150
	Marital Status	**0.28**	**0.04**	**0.0000****
	Respondent in wave	-0.85	18.15	0.9626
	Parent living	**-0.06**	**0.03**	**0.0213****
	Sigma	1.21	0.03	0.0000**

BIC = -21952.55 (N=3092)

Table 29. 5-group model with marital status as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (2.71%)	Intercept	0.54	894.99	0.9995
	Linear	0.12	0.17	0.4946
	Caregiving	**-1.46**	**0.53**	**0.0061****
	Marital Status	**1.08**	**0.53**	**0.0428****
	Respondent in wave	-1.62	894.98	0.9986
	Parent living	-0.45	0.67	0.5042
Group 2 (3.52%)	Intercept	-5.49	102.11	0.9571
	Linear	**15.55**	**1.14**	**0.0000****
	Quadratic	**-3.98**	**0.34**	**0.0000****
	Cubic	**0.32**	**0.03**	**0.0000****
	Caregiving	-0.38	0.46	0.4108
	Marital Status	-0.20	0.22	0.3464
	Respondent in wave	-8.91	101.43	0.9300
	Parent living	-0.34	0.26	0.1972
Group 3 (87.56%)	Intercept	4.77	44.11	0.9138
	Linear	**0.07**	**0.02**	**0.0000****
	Quadratic	-0.01	0.00	0.0589
	Caregiving	0.02	0.03	0.5905
	Marital Status	**0.20**	**0.05**	**0.0000****
	Respondent in wave	0.11	44.12	0.9980
	Parent living	-0.03	0.03	0.3298
Group 4 (3.19%)	Intercept	10.56	989.67	0.9915
	Linear	**-13.81**	**3.24**	**0.0000****
	Quadratic	**4.52**	**1.18**	**0.0001****
	Cubic	**-0.44**	**0.12**	**0.0002****
	Caregiving	-0.75	1.59	0.6372
	Marital Status	1.08	0.61	0.0779*
	Respondent in wave	4.65	991.67	0.9963
	Parent living	**-2.34**	**0.83**	**0.0047****
Group 5 (3.01%)	Intercept	0.57	28.36	0.9841
	Linear	**8.34**	**1.33**	**0.0000****
	Quadratic	**-3.47**	**0.47**	**0.0000****
	Cubic	**0.37**	**0.05**	**0.0000****
	Caregiving	-0.68	0.46	0.1357
	Marital Status	**0.69**	**0.27**	**0.0114****
	Respondent in wave	-6.60	29.84	0.8251
	Parent living	**4.32**	**1.25**	**0.0006****
	Sigma	1.07	0.03	0.0000

BIC = -20862.60 (N = 3092)

Hypothesis 3.1: Duration of the informal caregiving experience is associated with a larger depressing effect on caregivers' wealth trajectories over time.

Table 30. 3-group model with care duration as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (2.95%)	Intercept	0.03	0.50	0.9523
	Linear	**-0.58**	**0.20**	**0.0037****
	Care duration	0.64	0.51	0.2144
	Parent living	0.25	0.67	0.7081
Group 2 (9.91%)	Intercept	3.89	0.90	0.0000**
	Linear	-0.33	0.21	0.1292
	Care duration	-0.15	0.43	0.7237
	Parent living	-0.09	0.59	0.8739
Group 3 (87.14%)	Intercept	5.03	0.07	0.0000**
	Linear	**0.04**	**0.01**	**0.0022****
	Care duration	0.05	0.03	0.0836*
	Parent living	-0.01	0.04	0.8724
	Sigma	1.28	0.07	0.0000**

BIC = -30459.38 (N=869)

Hypothesis 3.2: Intensity of the informal caregiving experience is associated with a larger depressing effect on caregivers' wealth trajectories over time.

Table 31. 3-group model with care intensity as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (4.75%)	Intercept	3.12	1.20	0.0096**
	Linear	**-1.68**	**0.27**	**0.0000****
	Care Hours	**0.00**	**0.00**	**0.0000****
	Parent living	-0.57	0.94	0.5473
Group 2 (91.37%)	Intercept	5.08	0.06	0.0000**
	Linear	**0.05**	**0.01**	**0.0005****
	Care Hours	-0.00	0.00	0.2620
	Parent living	-0.05	0.05	0.2710
Group 3 (3.88%)	Intercept	0.38	0.81	0.6350
	Linear	**1.11**	**0.39**	**0.0049****
	Care Hours	**-0.00**	**0.00**	**0.0000****
	Parent living	-0.86	1.23	0.4841
	Sigma	1.08	0.06	0.0000**

BIC = -12304.01 (N=869)

Table 32. 5-group model with care intensity as covariate.

	Parameter	**β**	**S.E.**	***p***
Group 1 (3.43%)	Intercept	14.03	5.64	0.0130**
	Linear	**-13.70**	**6.23**	**0.0280****
	Quadratic	3.11	1.97	0.1148
	Cubic	-0.19	0.18	0.3067
	Care hours	**0.00**	**0.00**	**0.0037****
	Parent living	-1.10	0.89	0.2181
Group 2 (3.00%)	Intercept	-12.52	3.54	0.0004**
	Linear	**13.97**	**3.86**	**0.0003****
	Quadratic	**-3.50**	**1.29**	**0.0066****
	Cubic	0.28	0.13	0.0583*
	Care hours	0.00	0.00	0.6298
	Parent living	-0.74	0.99	0.4545
Group 3 (89.28%)	Intercept	5.05	0.08	0.0000**
	Linear	0.09	0.05	0.0635
	Quadratic	-0.01	0.00	0.2501
	Care hours	-0.00	0.00	0.2501
	Parent living	-0.04	0.05	0.4432
Group 4 (3.22%)	Intercept	-0.55	0.30	0.0659*
	Linear	**8.47**	**1.45**	**0.0000****
	Quadratic	**-2.61**	**0.52**	**0.0000****
	Cubic	**0.22**	**0.05**	**0.0000****
	Care hours	**-0.00**	**0.00**	**0.0011****
	Parent living	**-1.42**	**0.62**	**0.0217****
Group 5 (1.07%)	Intercept	25.65	0.96	0.0000**
	Linear	**-19.27**	**0.78**	**0.0000****
	Quadratic	**3.87**	**0.18**	**0.0000****
	Care hours	**-0.00**	**0.00**	**0.0000****
	Parent living	**-6.10**	**0.34**	**0.0000****
	Sigma	0.86	0.04	0.0000**

BIC = -10885.67 (N = 869)