



RESEARCH INSTITUTE FOR HOUSING AMERICA **SPECIAL REPORT**

Cognition and the Housing Behavior of Older Americans

Gary V. Engelhardt

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Table of Contents

Executive Summary 1

Introduction 2

Background and Data Description. 4

Homeownership 7

Profile of Homeowners 9

Profile of Renters.14

A Profile of Health, Functional Status, and Cognition.16

Cognitive Decline and Housing Behavior18

Conclusion22

Tables23

References35

List of Figures

1. Cognitive Function	4
2A. Distribution of Americans 65 and Older in 2012 by Race, Marital Status, and Education Groups	5
2B. Distribution of Americans 65 and Older in 2012 by Age Group, Veteran, and Employment Status	5
3A. Housing Tenure Distribution of Americans 65 and Older in 2012 by Race, Marital Status, and Education Groups	7
3B. Housing Tenure Distribution of Americans 65 and Older in 2012 by Age Group, Veteran, and Employment Status	7
4. Homeownership Rates by Age Group, 1998–2012	8
5A. Distribution of Homeowning Americans 65 and Older in 2012 by Race, Marital Status, and Education Groups	9
5B. Distribution of Homeowning Americans 65 and Older in 2012 by Age Group, Veteran, and Employment Status	9
6A. Median Housing-Equity-to-Income Ratio for Homeowning Americans 65 and Older in 2012 by Race, Marital Status, and Education Groups	10
6B. Median Housing-Equity-to-Income Ratio for Homeowning Americans 65 and Older in 2012 by Age Group, Veteran, and Employment Status	10
7A. Median Housing-Equity Portfolio Share (in Percent) for Homeowning Americans 65 and Older in 2012 by Race, Marital Status, and Education Groups	11
7B. Median Housing-Equity Portfolio Share (in Percent) for Homeowning Americans 65 and Older in 2012 by Age Group, Veteran, and Employment Status	11
8A. Percent of Homeowning Americans 65 and Older in 2012 with a Mortgage, by Race, Marital Status, and Education Groups	11
8B. Percent of Homeowning Americans 65 and Older in 2012 with a Mortgage, by Age Group, Veteran, and Employment Status	11
9A. Median Annual Mortgage-Payment-to-Income Ratio for Homeowning Americans 65 and Older in 2012 with a Mortgage, by Race, Marital Status, and Education Groups	12

9B. Median Annual Mortgage-Payment-to-Income Ratio for Homeowning Americans 65 and Older in 2012 with a Mortgage, by Age Group, Veteran, and Employment Status . . . . .	.12
10A. Percent of Americans 65 and Older in 2012 with Mortgages Who at Any Time in the Previous Two Years Had Fallen Behind in Payments by More than Two Months, by Race, Marital Status, and Education Groups . . . . .	.13
10B. Percent of Americans 65 and Older in 2012 with Mortgages Who at Any Time in the Previous Two Years Had Fallen Behind in Payments by More than Two Months, by Age Group, Veteran, and Employment Status . . . . .	.13
11A. Distribution of Renting Americans 65 and Older in 2012 by Race, Marital Status, and Education Groups . . . . .	.14
11B. Distribution of Renting Americans 65 and Older in 2012 by Age Group, Veteran, and Employment Status . . . . .	.14
12. Regression-Adjusted Age Profile of Incidence of Proxy Interview and Memory Disease. . . . .	.17
13. Regression-Adjusted Age Profile of Memory Measures. . . . .	.18
14. Regression-Adjusted Age Profile of Intact Mental Status . . . . .	.18
15. Regression-Adjusted Age Profile of Total Cognition Score . . . . .	.18
16. Regression-Adjusted Age Profiles of Homeownership and Difficulty with Money Management . . . . .	.19

List of Tables

1. Selected Summary Statistics on Financial Characteristics for Homeowners 65 and Older in 2012 by Demographic Characteristics, Veteran, and Employment Status. . . . .	.23
2. Selected Summary Statistics on Rent, Income, and Wealth for Renters 65 and Older in 2012 by Demographic Characteristics, Veteran, and Employment Status. . . . .	.25
3. Selected Summary Statistics on Functional Status and Health for Homeowners 65 and Older in 2012 by Demographic Characteristics, Veteran, and Employment Status. . . . .	.27
4. Selected Summary Statistics on the Incidence of Brain Disease and Function for Homeowners 65 and Older in 2012 by Demographic Characteristics, Veteran, and Employment Status. . . . .	.28
5. Selected Summary Statistics on Memory and Cognition for Homeowners 65 and Older in 2012 by Demographic Characteristics, Veteran, and Employment Status. . . . .	.29
6. Selected Summary Statistics on Functional Status and Health for Renters 65 and Older in 2012 by Demographic Characteristics, Veteran, and Employment Status. . . . .	.30
7. Selected Summary Statistics on the Incidence of Brain Disease and Function for Renters 65 and Older in 2012 by Demographic Characteristics, Veteran, and Employment Status. . . . .	.31
8. Selected Summary Statistics on Memory and Cognition for Renters 65 and Older in 2012 by Demographic Characteristics, Veteran, and Employment Status. . . . .	.32
9. Estimated Impact of a One Standard Deviation Decline in the Total Cognition Score on Housing and Living Arrangements . . . . .	.33
10. Estimated Impact of Reported Diagnosis of Memory Disease on Housing and Living Arrangements. . . . .	.33
11. Estimated Impact of a One-Standard Deviation Decline in Total Cognitive Score on Mortgage Outcomes . . . . .	.34
12. Estimated Impact of Reported Diagnosis of Memory Disease on Mortgage Outcomes . . . . .	.34

Executive Summary

America is aging. As the Baby Boom begins to enter retirement years, new challenges are arising with significant implications for both borrowers and lenders. In particular, given the impact of aging on memory and other cognitive skills, there is a need to consider the implication for financial decisions made by older individuals. By the time individuals are arriving into traditional retirement ages, when many important financial decisions are made, cognitive skills are already in decline as part of normal cognitive aging.

There are two important implications for the mortgage industry. First, mortgage choices have grown more complex over the years, and while this allows greater consumer choice, the added complexity places a higher burden on some older Americans with respect to financial decision-making. Second, cognitive limitations may affect the ability of some older Americans to manage their financial affairs and service debt, issues particularly salient for products designed to tap into the enormous housing equity held by older Americans.

This report uses data on the housing, functional, health, and cognitive status of older Americans in 2012 from the Health and Retirement Study (HRS) to profile the cognitive status of older Americans and examine the link between cognitive status and housing and mortgage decisions. In general, there is a strong link between cognition and these decisions. There are a number of principal findings:

- 28% of homeowners and 36% of renters aged 65 and older in 2012 rated themselves as having a fair or poor memory.
- 7% of homeowners and 16% of renters aged 65 and older in 2012 self-reported a medical diagnosis of memory disease.
- For older homeowners, memory and cognition hold relatively stable until the late 70s, then decline fairly rapidly.

- Likewise, the incidence of memory disease rises steadily with age. By age 90, about 20 percent of older homeowners suffer from memory disease.
- Typical declines in memory and cognition are associated with substantial increases in difficulty with managing money; a new diagnosis of memory disease, in particular, is associated with very large increases in such difficulty.
- A new diagnosis of memory disease is associated with large changes homeownership and shared living arrangements; typical declines in memory and cognition are associated with small to modest changes in these domains.
- Declines in memory and cognition are associated with an increase in mortgage delinquency, especially for older women.

As increased longevity pushes many financial decisions to later ages, there is substantial interest in the extent to which cognition can be improved and its natural decline forestalled. One pathway for this is the “use it or lose it” approach, in which more stimulating environments for older individuals, including the workplace, may help to preserve, and perhaps enhance, cognitive acuity. Borrowers and lenders will need to keep abreast of these developments as our understanding of aging, cognition and financial decision-making continues to evolve.

Introduction

Increasingly, cognitive skills are seen as critical determinants of financial outcomes and economic well-being over the life course. Cognitive psychologists often divide skills into those involving fluid intelligence and those involving crystallized intelligence. The former are thinking skills: executive function, abstract reasoning, and memory. These peak in the teenage years and then slowly depreciate with age. As individuals age through their early and mid-adult lives, the decline in fluid intelligence is offset by rising crystallized intelligence, which can be characterized as knowing skills, accumulated from formal and information education, training, and life experiences. These rise with age until individuals hit their 50's and then decline. So, by the time individuals are arriving into traditional retirement ages, when many important financial decisions are made, cognitive skills are already in decline as part of normal cognitive aging.

This has a number of important implications for the mortgage industry. First, secular changes in mortgage markets have generated products that simultaneously allow greater consumer choice and have embedded greater financial complexity, which together place a higher cognitive burden on older Americans in their financial decision-making now than in the past (Board of Governors of the Federal Reserve System, 2013). Compared to past birth cohorts, the Baby Boom cohorts are entering their retirement years with greater cognitive demands at ages when their skills would normally be declining. Second, cognitive limitations may affect the ability of some older Americans to manage their financial affairs and service debt, issues particularly salient for products designed to tap into the enormous housing equity held by older Americans. Third, life expectancy has risen substantially. Longer lives mean many financial decisions have been pushed to later ages, when individuals have normally lower skill levels, or are more prone to clinical forms of impairment, including dementia and Alzheimer's. Indeed, Hurd et al. (2013) estimated that 14.7% of the elderly had some form of clinical impairment and placed the current economic burden of dementia on society as \$157-\$215 billion per annum. If, as the adage goes, 85 is the new 65, then 85-year olds will be faced with many financial decisions that 65-year olds

once made, but now with lower cognitive acuity. Finally, with population aging, each year there are just more older individuals. So, greater cognitive burdens are placed on greater portions of adult America.

Against this backdrop, this report has three objectives: to profile the cognitive status of older Americans; to examine how aspects of cognition decline with age, beginning when individuals are in their mid-60s (i.e., traditional retirement years) until death; and, to examine empirically the link between cognitive skills and financial outcomes, especially those associated with housing and mortgage decisions, which have remained understudied by economists.

The analysis relies on the housing, functional, health, and cognitive status of older Americans, those aged 65 and older, using the most recent data available from the Health and Retirement Study (HRS). These data were drawn from interviews with approximately 25,000 Americans in 2012. This sample is representative of 43 million individuals 65 and older. The article is designed to lay out basic facts about the current state of housing, health, and cognition among older Americans and should be a useful statistical reference for the policymakers, advocates, and media interested in these issues in an aging society.

There are a number of principal findings:

- 28% of homeowners and 36% of renters aged 65 and older in 2012 rated themselves as having a fair or poor memory.
- 7% of homeowners and 16% of renters aged 65 and older in 2012 self-reported a medical diagnosis of memory disease.
- For older homeowners, memory and cognition hold relatively stable until the late 70s, then decline fairly rapidly.
- Likewise, the incidence of memory disease rises steadily with age. By age 90, about 20 percent of older homeowners suffer from memory disease.
- Typical declines in memory and cognition are associated with substantial increases in difficulty with managing money; a new diagnosis of memory disease, in particular, is associated with very large increases in difficulty with managing money.
- Typical declines in memory and cognition are associated with small to modest changes in homeownership and shared living arrangements.
- New diagnoses of memory disease are associated with large changes in homeownership and living arrangements.



- Declines in memory and cognition are associated with an increase in mortgage delinquency, especially for older women.

Throughout this report, all individuals ages 65 and older are referred to as “older Americans,” and those 85 and older are referred to as the “oldest old.”

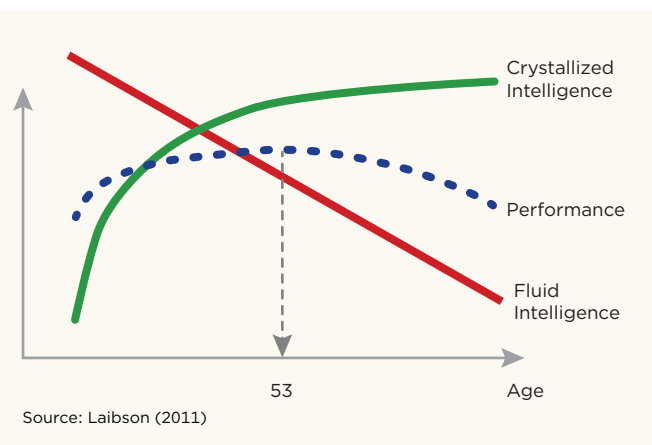
The report is organized as follows. Section II provides brief background information and a description of the HRS data. Section III profiles homeownership. Then section IV presents a disaggregated analysis of homeowners. Section V is a parallel analysis of renters. Then the report turns to the functional status, health, and cognition of older households, which are profiled in Section VI. Section VII presents estimates of cognitive decline and the impact of cognition on selected housing outcomes. There is a brief conclusion.

Background and Data Description

Cognitive psychologists often divide skills into those involving fluid intelligence and those involving crystallized intelligence. The former are thinking skills: executive function, abstract reasoning, and some aspects of memory. These are akin to economists' notion of "ability" (McArdle, et al., 2009). These peak in the teenage years and then slowly depreciate with age.

This decline is illustrated by the red line in Figure 1, which is taken from Laibson (2011). As individuals age through their early and mid-adult lives, the decline in fluid intelligence is offset by rising crystallized intelligence. This type of intelligence can be characterized as knowing skills, accumulated from formal and information education, training, and life experiences. These rise with age until individuals hit their 50's and stabilize; this is illustrated by the light-shaded line in the figure. Together, both types of intelligence, along with memory, combine to produce knowledge and performance in financial matters (McArdle et al., 2009). This is depicted by the dashed line in the figure. An important implication of the time path of both types of intelligence is that performance can rise, even while fluid intelligence is in decline, as "experience" trumps "ability." However, at some point, performance may peak. Agarwal et al. (2009) estimated that this peak occurs roughly at age 53 for some commonly used financial products. So, by the time individuals are older and arriving into traditional retirement ages, when many important financial decisions are made, cognitive skills are already in decline as part of normal cognitive aging.

FIGURE 1. COGNITIVE FUNCTION



Economists have recently given increased attention to the role of cognitive skills in the determination of financial outcomes and economic well-being. This includes work by Banks and Oldfield (2007), McArdle et al. (2009), Duca and Kumar (2014), Rohwedder and Willis (2010), Willis et al. (2014), Christelis et al. (2010), Brown et al. (2013), Kimball (2015), Gerardi et al. (2013), Agarwal et al. (2009), and Agarwal and Mazumder (2013), among others. Much of this existing work has treated stock market participation and overall wealth accumulation as the focal outcomes. There has been substantially less attention given to housing and mortgage decisions, despite the fact that substantive cognitive decline occurs at older ages when many important decisions concerning housing and living arrangements are made.

To begin to address this knowledge gap, this study analyzes the relationship between cognition and the housing characteristics of older Americans, defined as those 65 and older. It proceeds in two parts. First, it presents a snapshot of older Americans at a point in time, specifically 2012, on housing, health, and cognition. This is done for the older population as a whole, and then subgroups defined by homeownership, race, education, marital status, age, and veteran status. Broader measures of health are included in the analysis, because cognitive decline is often accompanied by physical decline in older adults, and physical status can itself have important impacts on housing behavior, independent from cognition. For the purposes of comparison of HRS results across calendar years, the organization and exposition is very close, and in some cases identical, to that of Engelhardt (2005), who analyzed the housing and health behavior of older Americans in 2000, and Engelhardt (2006) and Engelhardt et al. (2013), who followed up using data from 2004 and 2010, respectively. Second, the study uses longitudinal data on individuals to summarize the trajectories of cognition and housing behavior, and then link the two to estimate the impact of cognitive decline on housing and living arrangements as individuals move into old age.

The data for this analysis come from the Health and Retirement Study (HRS), a large, nationally representative sample of the American population aged 50 and older. Funded by the National Institute on Aging and the Social Security Administration, the HRS is, in many ways, a truly remarkable data-gathering effort. Specifically, the HRS is a stratified random sample of over 25,000 individuals 50 and older, and their spouses (regardless of age), that began in 1992. Individuals in the study are interviewed every two years until they die, at which point an “exit” interview is conducted with their next of kin. Therefore, the HRS is a longitudinal or panel survey that allows individuals to be followed from as early as their 50’s until death. Every six years (e.g., 1998, 2004, 2010, 2016, etc.), a new birth cohort of individuals in their mid-50s enters the study, refreshing the panel to ensure it remains representative of older Americans.

The public-use (or core) HRS data contain detailed information on characteristics and behavior central to the study of older individuals: demographics; extended family structure; employment and retirement; pensions and Social Security; housing; health; health care utilization; health insurance; income; assets, debts, and capital gains; transfers of time and money; information on children; disability; widowhood; expectations; life and long-term care insurance; and bequest motives.

The health information is extensive. Self-reported health information includes health status, a large number of diseases and medical conditions, indicators of depression, mental health, activities of daily living (ADLs), instrumental activities of daily living (IADLs), as well as height and weight. In addition, the HRS has gathered information over a number of years on cognition, including various validated measures of memory and intact mental status that capture major aspects of both fluid and crystallized intelligence. Unfortunately, for the period under study, the cognition questions are targeted to individuals 65 and older, so that the analysis is limited to adults in this age range. While this precludes the analysis of cognitive change for individuals just beyond the age 53 peak in Figure 1, the 65 and older age range does allow cognitive decline into old age and, ultimately, death to be identified quite well.

To provide a current snapshot of older individuals, this study uses data from 2012, which are the most recent data available, weighted by the HRS respondent sampling weights so that all statistics reflect the population of older Americans. In sum, the sample is representative of 42,433,715 individuals 65 and older in 2012.

Figure 2A illustrates the sample composition, by showing the distribution of individuals 65 and older by race, marital, and education groups. The majority were white, married, and had a high school education or more. In particular, a total of 87.2 percent of individuals were white, just under 9 percent of the individuals were African-American, and 4

FIGURE 2A. DISTRIBUTION OF AMERICANS 65 AND OLDER IN 2012 BY RACE, MARITAL, AND EDUCATION GROUPS

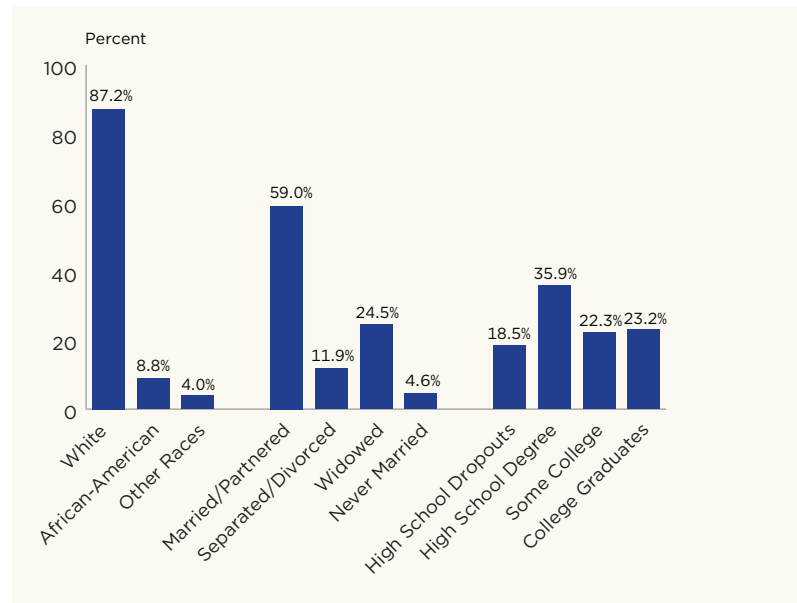
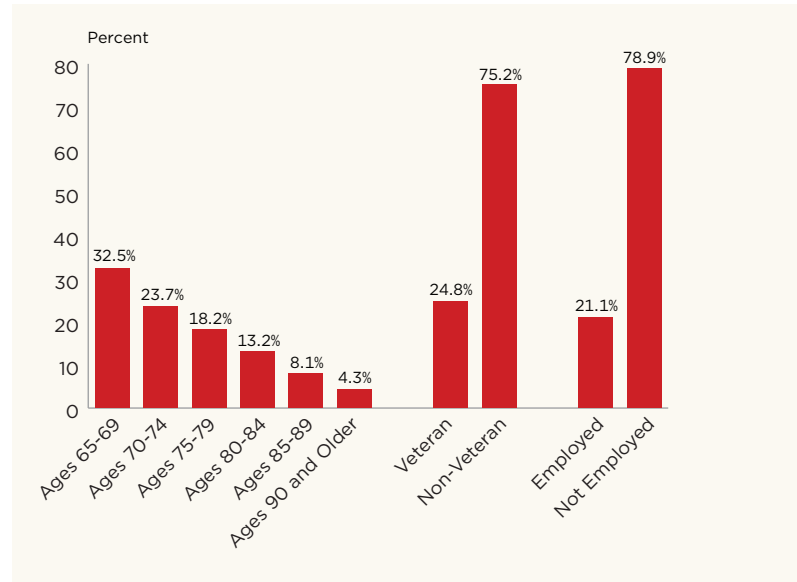


FIGURE 2B. DISTRIBUTION OF AMERICANS 65 AND OLDER IN 2012 BY AGE GROUP, VETERAN, AND EMPLOYMENT STATUS



percent of individuals self-reported other races. In terms of marital status, the two largest groups were married couples, 59 percent, and the widowed, 24.5 percent. Just under 12 percent were separated or divorced. Those with a high school degree comprised the largest portion of the older population, at 35.9 percent. Just under 20 percent had less than a high school degree.

Figure 2B shows the distribution of older households across five-year age groups, veteran, and employment status. Just over 12 percent of the sample was 85 and older. Referred to below as the “oldest old,” this group is one of the fastest growing portions of the total U.S. population. Currently, there are an estimated 6.3 million individuals 85 and older, which is 2% of the population. The U.S. Census Bureau projects that this group will grow to 19.7 million, or 5% of the population, by 2060. Almost a quarter of the sample are veterans, most of whom are men. Twenty-one percent were employed.

Homeownership

With this sample composition in mind, the analysis turns to homeownership. Figure 3A is a bar chart that show the breakdown of housing-tenure status by the population sub-group listed along the horizontal axis. The total height of each bar represents 100 percent of individuals in that category. There are three possible tenure statuses, the proportion of which is shown with different shading: homeowner, renter, and those who neither own nor rent. The last category primarily measures individuals who either co-reside with another adult, such as a child or other relative, or live independently in a structure that is owned by someone else.

Reading from left to right, the first bar indicates that the homeownership rate was 80.7 percent over all individuals. The remaining 19.3 percent were comprised of individuals who paid cash rent (14.5 percent) and those who neither owned nor rented (4.8 percent).

Figure 4 shows the aggregate homeownership rate based on data from the U.S. Census Bureau's Housing Vacancy Survey, by age category from 1998 through 2012, the period used later in the report for the analysis of cognitive decline. The homeownership rates for 45-54 and 55-64 year olds,

respectively, peaked in 2004 and then declined during the financial crisis and the Great Recession. In contrast, the homeownership rate for those 65 and older, the focal sample in this report, grew fairly consistently over this period, primarily because this group had comparatively less mortgage debt (as will be documented below) and constant inflation-adjusted income from Social Security that was not affected by the recession.

The remaining bars in Figures 3A and 3B describe housing tenure in 2012 for the same demographic groups as shown in Figures 2A and 2B. For example, the homeownership rate for whites was 82.8 percent, for African-Americans was 66 percent, and among those self-reporting other races was 67.9 percent. About 91 percent of married individuals were owners; the homeownership rate was substantially less for the other marital categories, the divorced, widowed, or never married. There was a steep homeownership gradient in education. Just under 89 percent of college graduates were owners, yet just 68 percent of those with less than a high school education. Figure 3B shows the age pattern of tenure status. Homeownership falls with age. The proportion who pay cash rent rises, as does the

FIGURE 3A. HOUSING TENURE DISTRIBUTION OF AMERICANS 65 AND OLDER IN 2012 BY RACE, MARITAL AND EDUCATION GROUPS

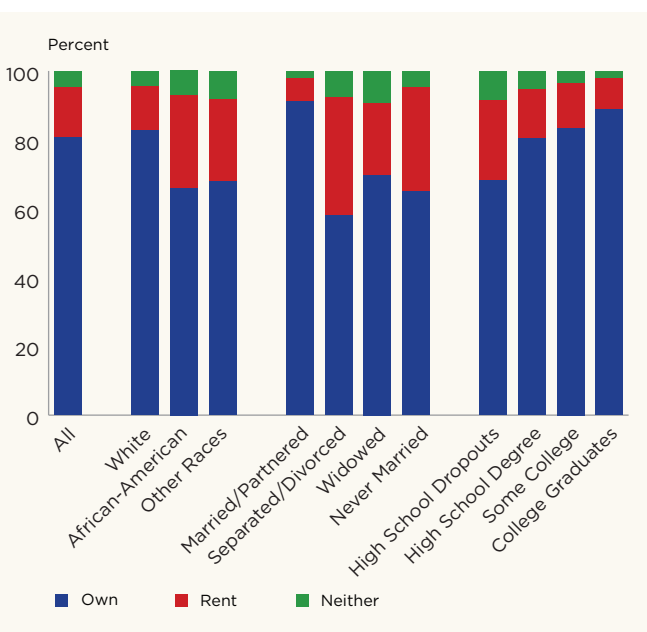
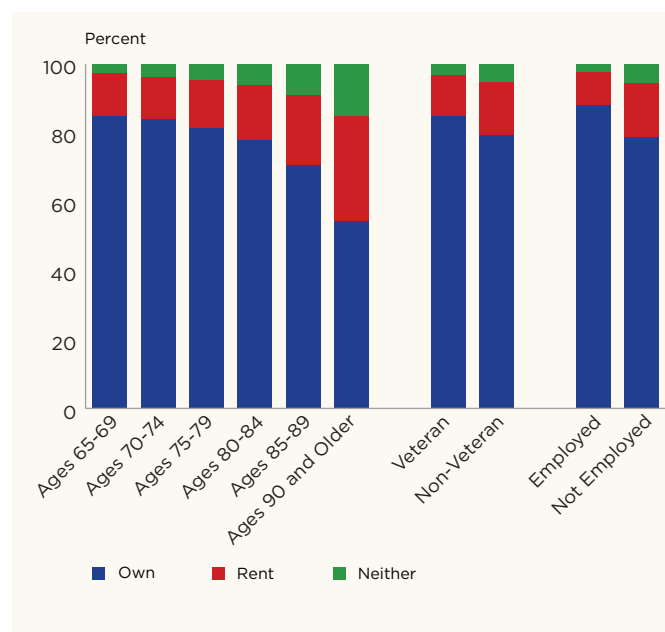
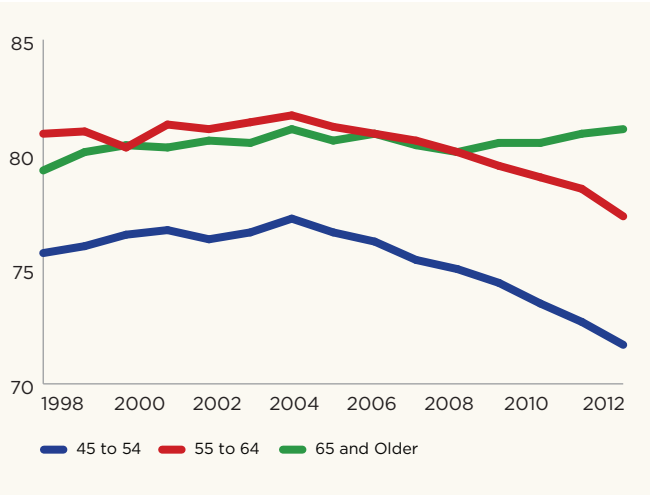


FIGURE 3B. HOUSING TENURE DISTRIBUTION OF AMERICANS 65 AND OLDER IN 2012 BY AGE GROUP, VETERAN AND EMPLOYMENT STATUS



**FIGURE 4. HOMEOWNERSHIP RATES
BY AGE GROUP, 1998-2012**



third housing-tenure designation: those who neither own nor pay cash rent.

The conclusions about the age-homeownership relationship should be tempered by the following caveat. As the figure shows tabulations by age for a single calendar year, the pattern of behavior across age groups cannot be interpreted necessarily as the pure relationship of homeownership to age. This occurs because members of each age group also are uniquely represented the same year-of-birth cohort, and behavior may have varied across cohorts for a variety of reasons that were independent of age. The second half of the report addresses this by using longitudinal data on the same set of individuals to track how housing behavior, in general, and homeownership, in particular, change as individuals age (and eventually die).

Profile of Homeowners

Next, the analysis focuses on persons in 2012 who were homeowners. Figures 5A and 5B examine the composition of homeowners in 2012, by showing the distribution of home-owning individuals by demographic characteristics, veteran, and employment status. Homeowners 65 and older were predominantly white, married, with a high school degree. A quarter of homeowners were veterans. Most older homeowners were out of the labor force.

Table 1 presents selected statistics on financial characteristics for homeowners. Each column represents a housing- or financial-behavior outcome; each row represents the relevant population subgroup. Two statistics are reported for each of the outcomes: the mean value (expressed in 2012 dollars); and the median value. The mean represents the average value of the outcome across homeowners in the subgroup. With the tabulations in Figures 2A, 2B, 5A, and 5B, these means can be used to construct national estimates for the population or subgroup as a whole. The median represents the midpoint in the

distribution of that outcome, such that half of the homeowners in that row's population subgroup had outcomes above the median level, and half had outcomes below the median level. The median is a useful summary statistic, especially when the outcome is significantly skewed, i.e., a small slice of households has disproportionately large (or small) values. For example, most homeowners have a modest amount of home equity. In the first row of the table, for which the population group is all homeowners, median housing equity, defined as the difference between housing asset value (including the secondary residence, if any) and associated mortgage debt, was \$130,000. Thus, half of older homeowners had housing equity greater than \$130,000 and half had less than \$130,000. However, a small number of older homeowners have amassed a great deal of home equity. This figures into the mean, which is much larger at \$187,373, but not the median. For the purposes of this study, the median is the preferred measure, unless otherwise noted. It should be thought of as measuring the outcome for the typical homeowner.

FIGURE 5A. DISTRIBUTION OF HOMEOWNING AMERICANS 65 AND OLDER IN 2012 BY RACE, MARITAL AND EDUCATION GROUPS

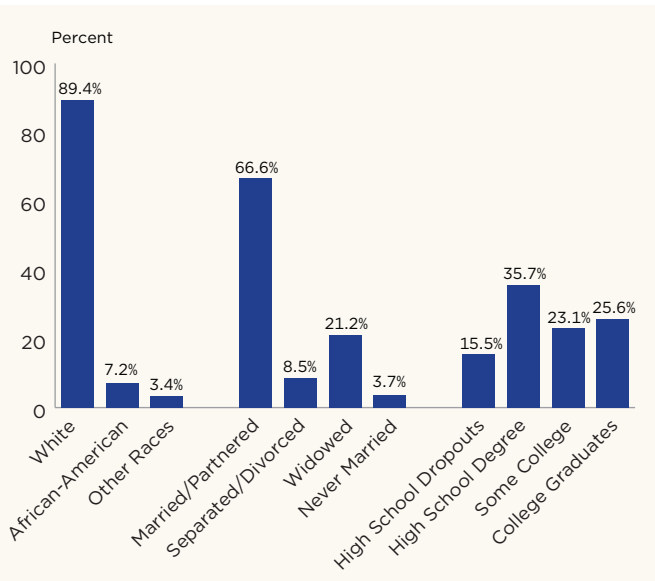


FIGURE 5B. DISTRIBUTION OF HOMEOWNING AMERICANS 65 AND OLDER IN 2012 BY AGE GROUP, VETERAN, AND EMPLOYMENT STATUS

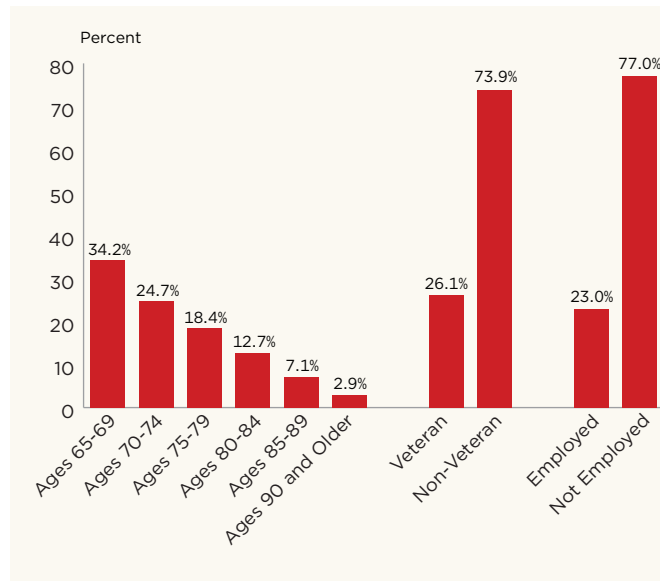
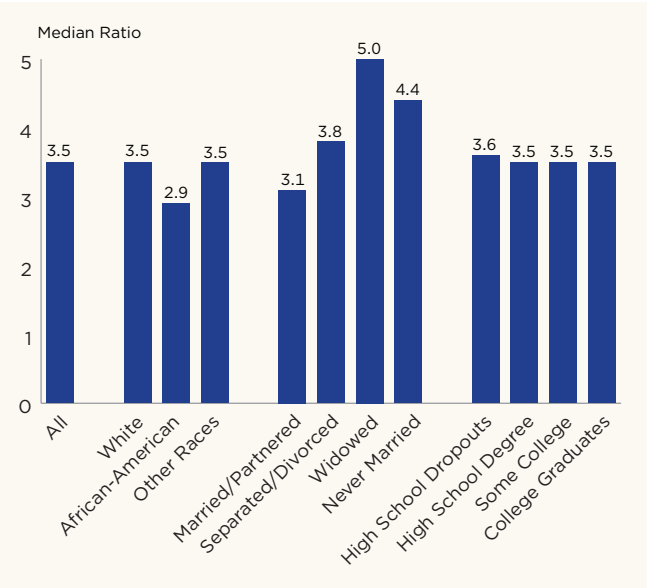


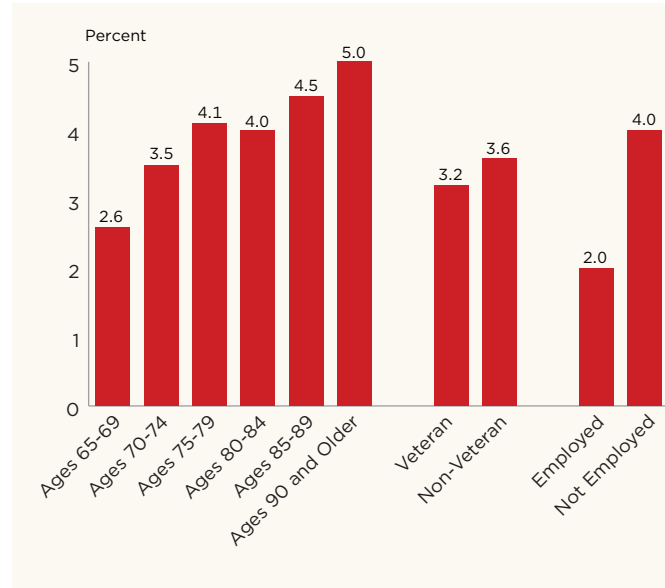
FIGURE 6A. MEDIAN HOUSING-EQUITY-TO-INCOME RATIO FOR HOMEOWNING AMERICANS 65 AND OLDER IN 2012 BY RACE, MARITAL, AND EDUCATION GROUPS



From columns 1 and 2 of Table 1, median home equity for all older homeowners was \$130,000, and median household income from all sources was \$34,805. Figures 6A and 6B show the median housing-equity-to-income ratio by demographic, veteran, and employment group. Over all homeowners, the median ratio was 3.5:1, which means that the typical older homeowner household had housing equity equal to three-and-a-half times its annual income.¹ This ratio is 5:1 for widows and 4.4:1 for the never married; the equity-to-income ratio rises with age. Therefore, many homeowners, and especially the oldest and unmarried, were relatively house-rich and income-poor.

Column 3 of Table 1 shows the median (and mean) total household wealth. For this study, wealth is measured as the sum of housing equity, the value of vehicles, collectibles, businesses, and financial assets, less the value of all debt. It excludes the net present value of public and private pension benefits. Median wealth was \$271,534 in 2012. Mean wealth was much higher, \$590,051. This reflects the skewness of the wealth distribution: some older homeowners have amassed a great deal of wealth.

FIGURE 6B. MEDIAN HOUSING-EQUITY-TO-INCOME RATIO FOR HOMEOWNING AMERICANS 65 AND OLDER IN 2012 BY AGE GROUP, VETERAN, AND EMPLOYMENT STATUS



great portion of this wealth is in housing. This is illustrated in Figures 7A and 7B (see next page). They show the housing-to-wealth ratio. This is defined as the percent of all wealth that is in housing. For the typical older homeowner, 53 percent of total wealth was in the form of housing. For minority and less educated homeowners, this percentage is even higher: roughly 92 and 83 percent for African-Americans and high school drop-outs, respectively. These households have very little wealth beyond their home.

The subsequent six panels of Table 1 (panels A–F) provide separate tabulations for elderly homeowners by race, marital status, education, age, veteran, and employment status. In panel A, white homeowners had higher median housing equity, income, and wealth than African-American homeowners and those of other races. Married couples had the highest housing equity, income, and wealth (see Panel B); the widowed and divorced had the lowest. Housing equity rose with education (panel C) and peaked between ages 75–84 (panel D).

¹ The housing-equity-to-income ratio was calculated first on a household-by-household basis, and then the median and mean of this ratio was calculated. In general, the ratio of the median housing equity in column 2 to the median income in column 3 will not equal the median of the ratio of housing equity to income.

FIGURE 7A. MEDIAN HOUSING-EQUITY PORTFOLIO SHARE (IN PERCENT) FOR HOMEOWNING AMERICANS 65 AND OLDER IN 2012 BY RACE, MARITAL, AND EDUCATION GROUPS

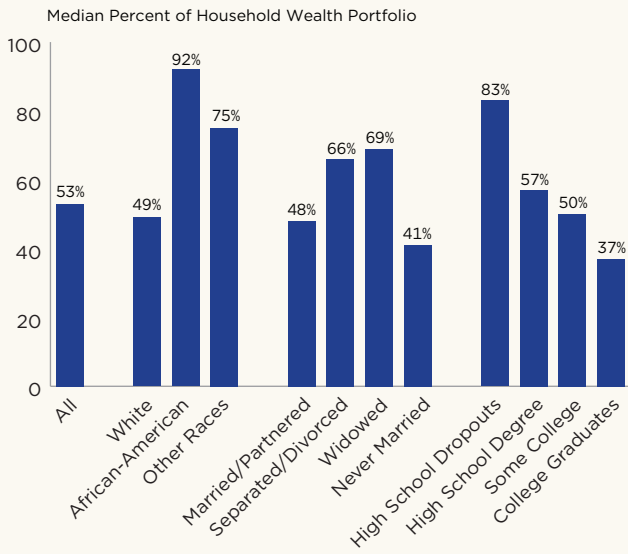
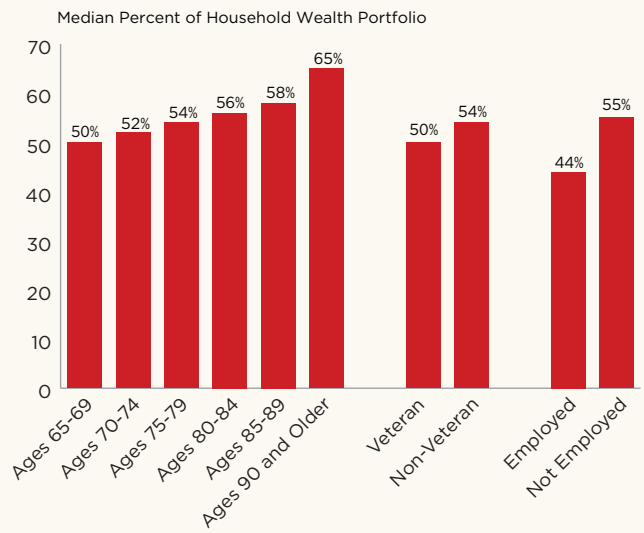


FIGURE 7B. MEDIAN HOUSING-EQUITY PORTFOLIO SHARE (IN PERCENT) FOR HOMEOWNING AMERICANS 65 AND OLDER IN 2012 BY AGE GROUP, VETERAN, AND EMPLOYMENT STATUS



Figures 8A and 8B show the percent of older homeowners who had a mortgage on either the primary or secondary (if any) residence by demographic group, veteran, and employment status. Roughly 28 percent of older homeowners had a mortgage in 2012. The mean and median mortgage debts, conditional on having a mortgage, were \$125,951 and \$88,000, respectively, as shown in column 4

of Table 1.² Column 5 shows the mean and median annual mortgage payments, which were \$14,743 (or \$1,129 per month) and \$9,672 (or \$806 per month), respectively. To get a sense of this mortgage burden, Figures 9A and 9B show the median of the ratio of annual mortgage payments to household income by demographic group, veteran, and employment status for those homeowners

FIGURE 8A. PERCENT OF HOMEOWNING AMERICANS 65 AND OLDER IN 2012 WITH A MORTGAGE BY RACE, MARITAL, AND EDUCATION GROUPS

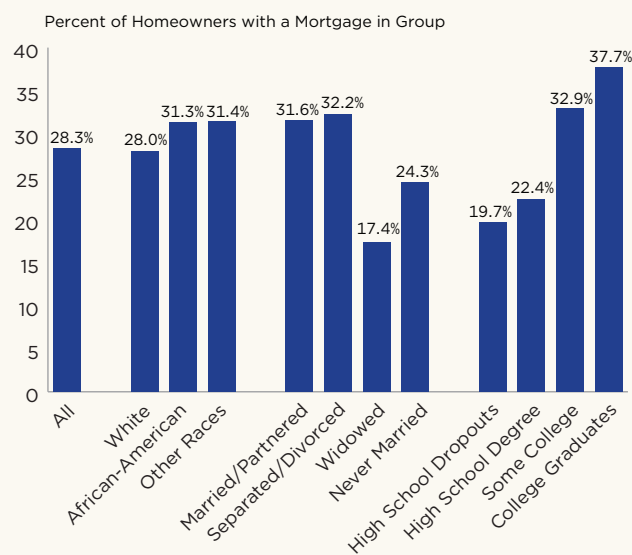
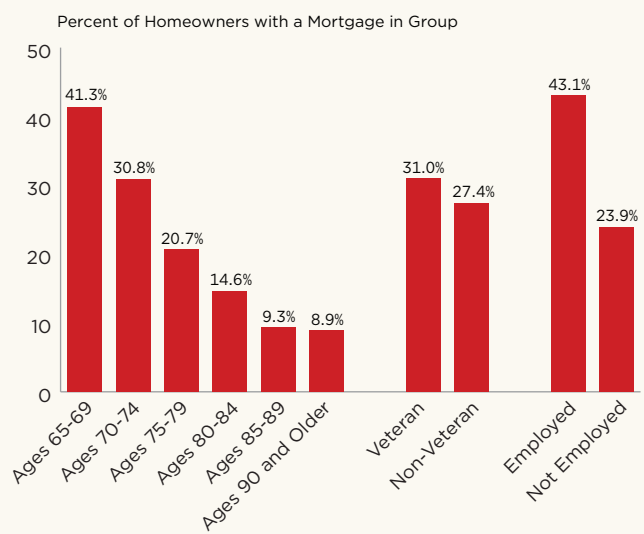
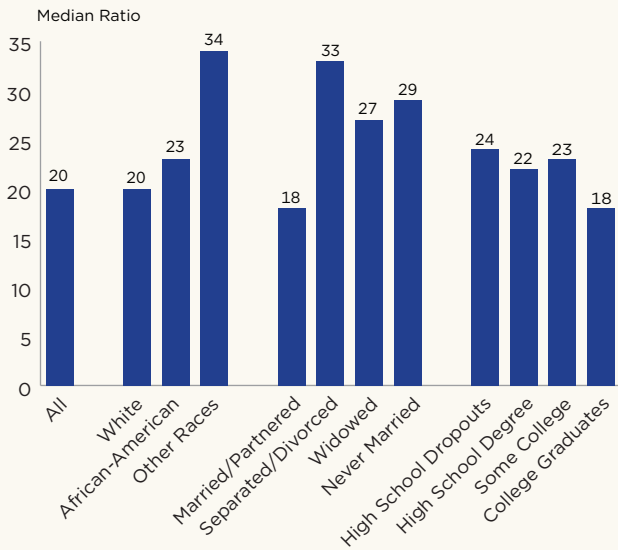


FIGURE 8B. PERCENT OF HOMEOWNING AMERICANS 65 AND OLDER IN 2012 WITH A MORTGAGE BY AGE GROUP, VETERAN, AND EMPLOYMENT STATUS



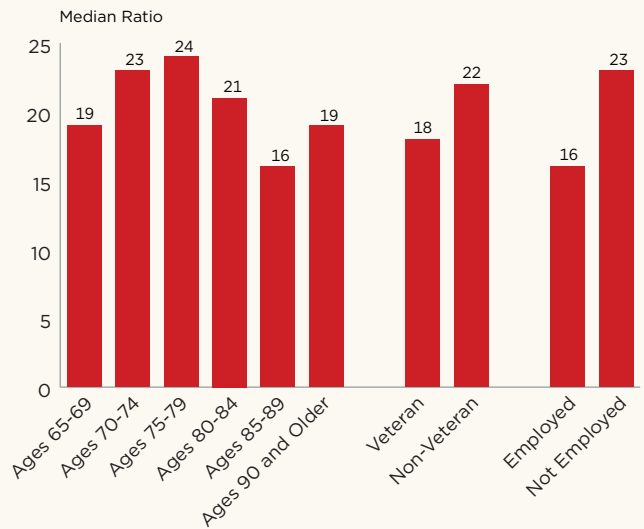
² Mortgage balances and payments are the sum of those for up to three mortgages on the primary residence and for a second residence.

FIGURE 9A. MEDIAN ANNUAL MORTGAGE-PAYMENT-TO-INCOME RATIO FOR HOMEOWNING AMERICANS 65 AND OLDER IN 2012 WITH A MORTGAGE, BY RACE, MARITAL, AND EDUCATION GROUPS



with a mortgage. For all such homeowners, the median ratio was 0.20. i.e., the typical older homeowner with a mortgage made payments equal to 20 percent of annual gross income. Divorced homeowners had one of the highest ratios. Their mortgage payments were 33 percent of income at the median.

FIGURE 9B. MEDIAN ANNUAL MORTGAGE-PAYMENT-TO-INCOME RATIO FOR HOMEOWNING AMERICANS 65 AND OLDER IN 2012 WITH A MORTGAGE, BY AGE GROUP, VETERAN, AND EMPLOYMENT STATUS



Starting in 2008, the HRS asked respondents about mortgage delinquency. Specifically, the survey asked if at any time in the last two years the respondent had fallen behind in mortgage payments by more than two months. Figures 10A and 10B (see next page) show the incidence of this measure of delinquency by demographic group, veteran, and employment status for homeowners with a mortgage.³ In Figure 10A, 4.6% of homeowners 65 and older with a mortgage had been delinquent at some point in the two-year interval from 2010 to 2012.⁴ These rates were significantly higher for non-whites, the lesser educated, and those not married.

³ Because a smaller fraction of older homeowners have mortgages (than younger homeowners) and delinquency was less prevalent, some of the demographic groups that were disaggregated in previous charts were aggregated in Figures 10A and 10B to produce more reliable estimates of 60+ day delinquency.

⁴ Trawinski (2012) calculated a 90+ day delinquency rate of around 2.5% for individuals 65 and older using CoreLogic data for 2011, the midpoint of the 2010-2012 interval in the HRS. Since the CoreLogic data measure at a point in time, whereas the HRS asks about 60+ days and over a two-year interval, the estimates above and Trawinski's estimates are not directly comparable.

FIGURE 10A. PERCENT OF AMERICANS 65 AND OLDER IN 2012 WITH MORTGAGES WHO AT ANY TIME IN THE PREVIOUS TWO YEARS HAD FALLEN BEHIND IN PAYMENTS BY MORE THAN TWO MONTHS BY RACE, MARITAL, AND EDUCATION GROUPS

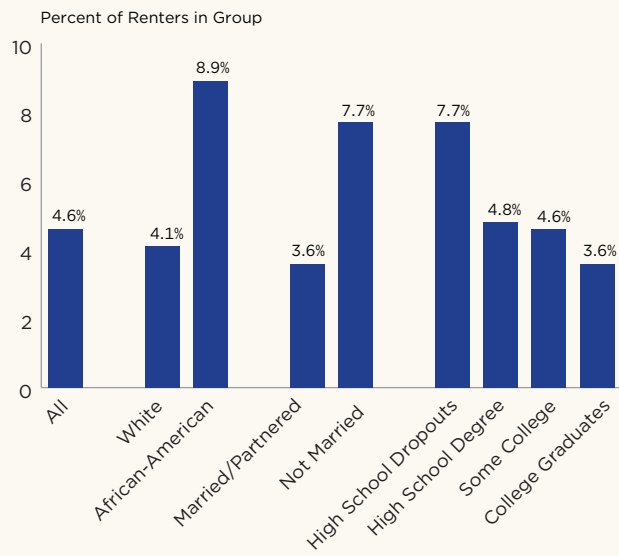
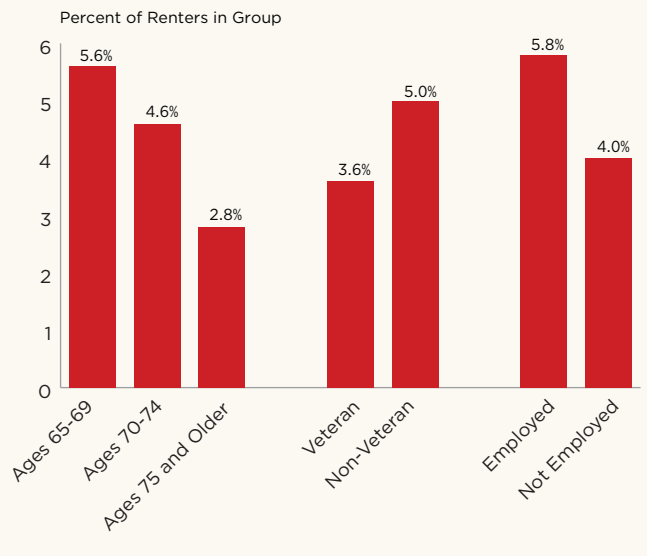


FIGURE 10B. PERCENT OF AMERICANS 65 AND OLDER IN 2012 WITH MORTGAGES WHO AT ANY TIME IN THE PREVIOUS TWO YEARS HAD FALLEN BEHIND IN PAYMENTS BY MORE THAN TWO MONTHS BY AGE GROUP, VETERAN, AND EMPLOYMENT STATUS



Profile of Renters

Next, renters are profiled. Figures 11A-11B show the distribution of older renters by demographic group, veteran, and employment status. A “renter” is defined as paying cash rent. Those who neither owned nor rented represented 4.8 percent of all older individuals (Figure 3A) and the rate rises to as much as 15 percent among the oldest old (Figure 3B). So, this is an important tenure category among the old; however, sample sizes in the HRS become too small for the disaggregated analysis presented in Figures 11A-11B. So, these individuals are not included here. In the analysis of cognitive decline presented below, individuals who transition from owning into this tenure classification are included in the analysis sample.

Table 2 provides a financial profile of older renters. Not surprisingly, renters were substantially less well off than owners. Their median income was \$18,050, almost half of the median income of homeowners. In addition, the median wealth of renters was \$4,880. Thus, the typical elderly renter had almost no assets.

In interpreting these tabulations, it is important to note that older renters are comprised of two main groups. The first group is those who have had relatively lower lifetime socio-economic status (SES). Approximately 10 percent of elderly individuals have never owned a home at any point

in their lives. These individuals had low lifetime and current incomes. The second group consists of prior homeowners who have sold their homes and now rent. The presence of the second group can be seen in the first row of Table 2. There, even though the median renter wealth was \$4,880, the mean wealth was \$133,574. This vast spread between the median and mean indicates the presence of some very wealthy renters. Wealth disparities also can be seen in panel C of the table. It shows that renter wealth rose steeply with education.

Column 3 shows that the median annual rent for all renters was \$7,200, or \$600 per month. To get a sense of the rent burden for older households, column 4 shows the annual rent-to-income ratio. The median rent-to-income ratio is 0.32, i.e., the typical elderly renter spent 32 percent of annual gross income on rent. Column 5 shows an alternative measure of rent burden: the percentage of renters who paid 30 percent or more of annual gross income in rent. This threshold is a commonly used cut-off in studies of housing affordability and one of the factors used by the federal government and housing authorities in the amount of subsidy for public and Section 8 housing. For all older renters, 51 percent had rent-to-income burdens of over 30 percent, suggesting that the availability of affordable rental housing is an important issue for older persons.

FIGURE 11A. DISTRIBUTION OF RENTING AMERICANS 65 AND OLDER IN 2012 BY RACE, MARITAL, AND EDUCATION GROUPS

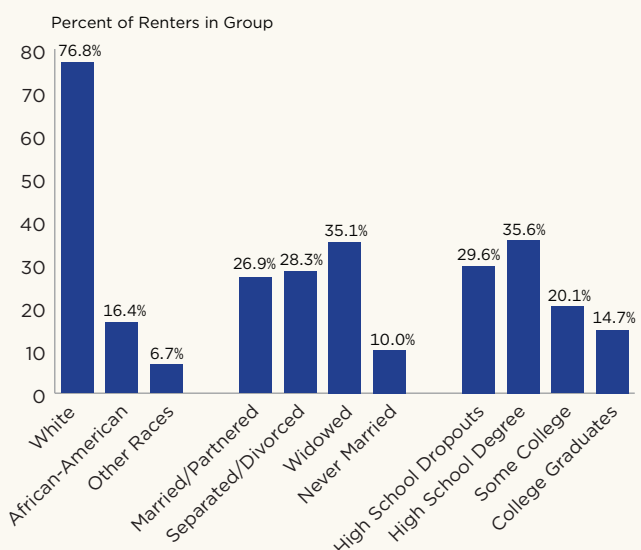
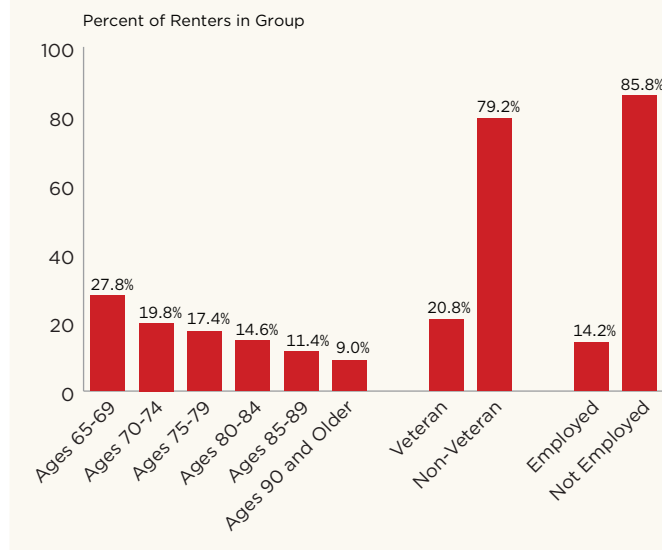


FIGURE 11B. DISTRIBUTION OF RENTING AMERICANS 65 AND OLDER IN 2012 BY AGE GROUP, VETERAN, AND EMPLOYMENT STATUS



A Profile of Health, Functional Status, and Cognition

Table 3 is modeled after Tables 1 and 2, and presents a profile of functional status and health, and how they are related to demographic characteristics, veteran, and employment status, respectively. This table focuses on homeowners.

Column 1 reports the percent of individuals who had proxy interviews in the HRS in 2012. Such an interview occurs when a respondent is unable or unwilling to be interviewed. In this case, the HRS interviews a “proxy,” typically a spouse or other family member, about the respondent. When such an interview occurs, the HRS queries about the reason why the respondent cannot or will not participate. In the majority of the cases, the proxy indicates the respondent has a cognitive impairment that prevents participation. Thus, a proxy interview is a metric of cognition. In addition, a number of memory and cognition questions used below are only asked in regular (i.e., non-proxy) interviews, so that it is important to track proxy and non-proxy status. From column 1, just under 5 percent of individuals had proxy interviews in 2012. Incidence falls with education and rises with age. One in six interviews among those 90 and older were proxy interviews.

Column 2 reports the mean number of health conditions. In particular, the HRS asks whether a doctor had ever told the respondent he or she had one of the following conditions: high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, psychiatric problems, and arthritis. The index employed then is a count of the number of such conditions. It ranges from 0 (the absence of all eight conditions) to 8 (the presence of all eight conditions); a larger index value indicates poorer health. The mean number of conditions was 2.5.

The third column indicates the body-mass index (BMI). BMI is defined as weight, expressed in kilograms, divided by the square of height, measured in meters. An individual with a BMI value of less than 18.5 is considered clinically underweight; between 18.5 and 24.9 is considered normal; between 25 and 29.9 is considered overweight; and 30 or higher is considered clinically obese. Mean BMI was 27.7.

The next column shows a count of the number of limits to five different aspects of mobility: walking several blocks, walking one block, walking across the room, climbing several flights of stairs, and climbing one flight of stairs.

For each of the five tasks, the index records a 1 if the respondent reports having had difficulty with that task and a zero otherwise. Then the scores are summed for the five tasks, so that the mobility index ranges from 0 (no difficulties with any of the tasks) to 5 (difficulties with all of the tasks). Therefore, this index measures mobility outside of the living space. The mean of this measure was 1.2 over all homeowners. Mobility is better for the more educated and worse for older individuals.

The HRS asks individuals to assess their overall health as either excellent, very good, good, fair, or poor. Column 5 shows the tabulation of the percent of individuals who self-reported being in either fair or poor health. About a quarter of all homeowners 65 and older reported being in fair or poor health in 2012. This percentage is higher for non-white, widowed, lesser-educated, and older individuals.

The final column shows the mean number of limits to Activities of Daily Living (ADLs). These activities are bathing, eating, dressing, walking across a room, and getting in and out of bed. They are used to measure various dimensions of an individual's ability to function in his or her residential space. For each of the five tasks, the index records a 1 if the respondent had difficulty with that task and a zero otherwise. The scores are summed for the five tasks, so that the ADL index ranges from 0 (no difficulties with any of the tasks) to 5 (difficulties with all of the tasks). The overall mean is 0.3, but this rises with age.

In addition to these measures of health and functional status, the HRS gathers information on cognition. Column 1 of Table 4 shows the incidence of memory disease for homeowners in 2012, based on a question in which the respondent (or proxy) is asked about whether a doctor had ever indicated that the individual had memory disease. So, this is a self-reported, but not necessarily self-assessed, measure. About 7 percent of homeowners reported memory disease. Incidence was highest among the widowed, fell with education, and rose sharply with age. Just over 20 percent of homeowners 85 and older reported memory disease. As a comparison, columns 2 and 3 show the incidence of strokes and psychiatric or mental illness, both of which, independently, can be associated with reductions in cognitive function.

Table 5 shows basic statistics on memory and cognition for homeowners. Memory and cognition are inputs into both fluid and crystallized intelligence; the HRS does not attempt to separately identify the two types of intelligence. As with health, the HRS asked individuals to rate their memory as excellent, very good, good, fair, or poor. Column 1 shows the percent with fair or poor self-rated memory. About 28% of homeowners rated their memories as fair or poor.

Columns 2-5 give more objective information on memory and cognition. The HRS employs two word-recall tests to assess episodic memory. In the first, known as immediate word recall, the respondent is read a list of 10 nouns and asked to repeat as many as possible. Then a short set of questions on another topic is given, and the respondent is again asked to repeat as many of the original ten words as possible. This follow-up is known as the delayed word recall. Each recall test is scored on a scale from 0 to 10, indicating the number of words correctly remembered. The higher the score, the better the episodic memory. The mean number of words recalled was 5.2 immediately (Column 2) and 4.2 delayed (Column 3), respectively.

Column 4 shows a measure of working memory based on the serial-sevens test (Ofstedal et al., 2005). In this test, the respondent is asked to count backward from 100 by 7. To perform correctly, the individual must not only subtract correctly from any given number, but remember the next number from which to subtract seven. So, this test combines some form of numeracy and working memory. The test is scored on a scale of 0 (not able to subtract seven once) to 5 (able to subtract seven five times). The higher the score, the better. The mean number of sevens correctly subtracted was 3.6.

Column 5 presents the average score on a mental status battery that is based on a modified version of the widely used Telephone Interview for Cognitive Status (TICS) test of cognitive functioning. It is scored on a fifteen-point scale, where a higher score is associated with higher cognitive functioning. The mean score was 12.7

Column 6 presents the total cognition score, which is the sum of the scores in Columns 2, 3, and 5. It has a scale that runs from 0 to 35, and is designed as an aggregate measure of memory and cognition. Both within this column, as well as within the individual components in columns 2-5, there are very strong gradients in memory and cognition by age, education, and marital status. Memory and cognition fall with age, rise with education, and are lowest among the widowed.

Tables 6-8 repeat this analysis of health, functional status, and cognition for renters. The patterns conform to what is widely known about cognition, functional status, health, race, and SES (Adams, et al., 2003): higher SES groups, such as the highly educated and homeowners had fewer functional limitations, better memory and cognition, and had better health than low SES groups; whites had better physical and cognitive functioning and health than African-Americans; and functional status, cognition, and health declined with age. Broadly speaking, renters are in worse health, have lower functional status, and lower cognition than owners.

Cognitive Decline and Housing Behavior

Tables 4-5 and 7-8 provide a snapshot of memory and cognition in 2012, a single point in time; they do not track cognitive change over time. To track change and, in particular, cognitive decline, the remainder of the analysis focuses on panel or longitudinal data on the same set of individuals observed in multiple calendar years in the HRS. To do so, the sample is limited to individuals who were 65 and older and did not have a proxy interview in 1998. The 1998 wave of the HRS was the first in which the survey was fully representative of the population 50 and older. Furthermore, since most older individuals owned their homes, and to focus on housing and mortgage outcomes, the sample is further limited to those who were homeowners in 1998. There are a total of 13,950 individuals in this sample. These individuals are then followed over time, interviewed in subsequent waves, which occurred every other even-numbered calendar year from 2000 through 2012. If the individual died, they attrited from the sample. When weighted, this sample represented 23,397,259 individuals in 1998.

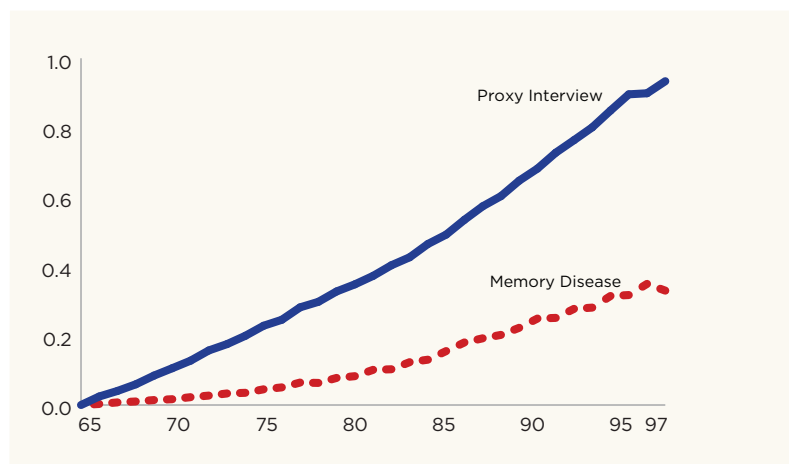
Figure 12 plots the regression-adjusted age profiles for the incidence of a proxy interview and memory disease, respectively. The dashed line is the profile for memory disease, and it is constructed as follows. As individuals with memory disease also often have other medical conditions and functional limitations that might be simultaneously changing with age, the profile is constructed using regression-based methods to adjust for the presence of the following factors: body mass index (BMI), the number of limitations to physical mobility, the number of limitations to activities of daily living, and the presence of high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, arthritis, and psychiatric conditions. The profiles also account for calendar year, race, education, income, wealth, veteran, employment, and marital status. In addition to these observable differences in health and economic circumstances across individuals in the sample, the profile uses repeated observations on the same individual to account for any time-invariant unobserved differences between

individuals.⁵ Therefore, the profile shows the incidence of memory disease by single year of age, independent of these health, economic, and time-invariant factors.

For the purposes of exposition, the profile is scaled to be 0 at age 65. As individuals age, the incidence of memory disease rises fairly smoothly. At age 80, the index value is 0.083, which says the likelihood of memory disease is 8.3 percentage points higher at age 80 relative to age 65. At age 90, the index value is 0.249: the likelihood of memory disease is 24.9 percentage points higher at age 90 relative to age 65.

The regression-adjusted profile for the incidence of a proxy interview is the solid line in the figure, and it is constructed in the same manner. As individuals age, the incidence of a proxy interview rises substantially. At age 80, the index value is 0.35: individuals are 35 percentage points more

FIGURE 12. REGRESSION-ADJUSTED AGE PROFILE OF INCIDENCE OF PROXY INTERVIEW AND MEMORY DISEASE



⁵ Specifically, the profile is constructed from the estimated single-year-of-age effects in a regression specification in which the outcome is modeled as a function of BMI, the number of limitations to physical mobility, the number of limitations to activities of daily living, and the presence of high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, arthritis, and psychiatric conditions, calendar-year effects, race, education, veteran status, employment status, marital status, income, and wealth. The model is estimated using a fixed-effects (within) estimator to account for time-invariant unobserved heterogeneity in the outcome.

likely to be unable to be interviewed on their own because of a cognitive or physical limitation. At 90, this rises to 68 percentage points. From both profiles in the figure, the likelihood of significant cognitive impairment rises significantly with age.

Figures 13 and 14 show similar profiles for the measures of memory and cognition in Tables 5 and 8. The memory measures are shown in Figure 13: immediate word recall, delayed word recall, and serial sevens, respectively. The number of serial sevens counted backwards from 100, which is measured on the right-hand vertical axis, declines steadily with age. The number of words recalled is measured on the left-hand vertical axis. The immediate word recall measure begins to decline in the late 70s; delayed word recall appears to get better with age, until about age 80, then declines. Figure 14 shows the regression-

FIGURE 13. REGRESSION-ADJUSTED AGE PROFILE OF MEMORY MEASURES

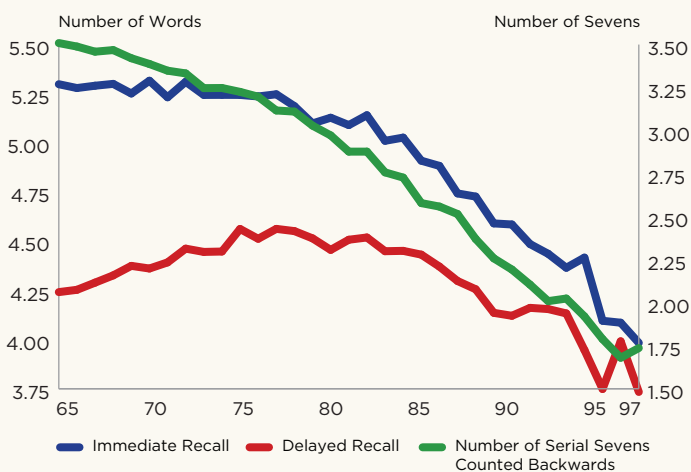
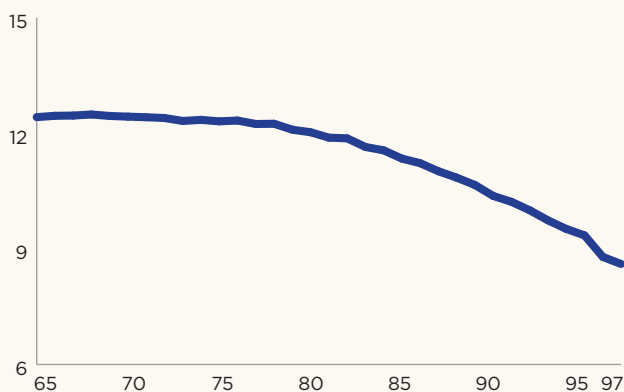


FIGURE 14. REGRESSION-ADJUSTED AGE PROFILE OF MEMORY MEASURES



adjusted age profile for intact mental status, based on the TICS cognitive functioning test and with a scale from 0 to 10. This profile is relatively flat until the late 70s, then declines significantly with age. Finally, Figure 15 shows the profile for the total cognition score, which sums the scores of the two recall measures and the mental status measure. This aggregate measure of cognition is steady until the late 70s, then declines significantly with age. The decrease in the total cognition score from ages 65 to 95 is 4.8, which is roughly equal to the standard deviation of the score (which is 5.1).

To preview the estimation results on housing behavior presented next, Figure 16 shows the regression-adjusted age profile for two outcomes: difficulty in managing money (the solid line) and homeownership (the dashed line). The profile for the former is scaled to be 0 at age 65; since all individuals in this longitudinal sample begin as homeowners in 1998, the latter profile is scaled to be 1 at age 65. If cognitive decline contributes to difficulty in financial decision-making, then as cognition is falling with age, money management issues should be rising with age. This is exactly what is depicted in the figure. Difficulty with money management is roughly the same in the mid-70s as it is at age 65, and then begins to rise around 80. At age 80, the index value is 0.068: individuals are 6.8 percentage points more likely to have difficulty in managing their money than at age 65. At 90, this rises to 26.4 percentage points. Just when the likelihood of these difficulties rise, the age profile of homeownership falls. At age 80, this index value is 0.91. That is, 91% of those who were homeowners at age 65, still are. After age 80, homeownership starts to decline faster. By age 90, just under 70% of those who were homeowners at age 65, still are.

In combination, the age profiles in Figures 12-16 suggest that cognitive decline might explain the housing behavior of homeowners as they age. This is illustrated formally in

FIGURE 15. REGRESSION-ADJUSTED AGE PROFILE OF TOTAL COGNITION SCORE

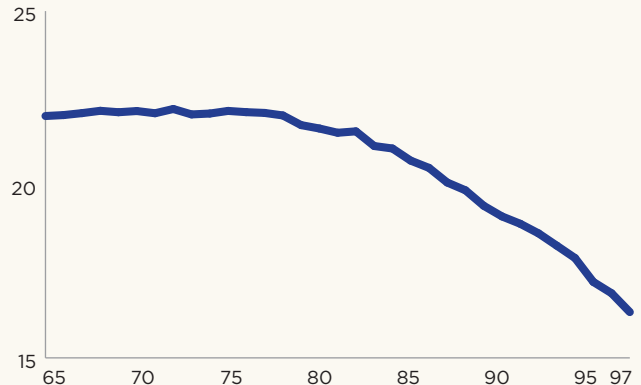
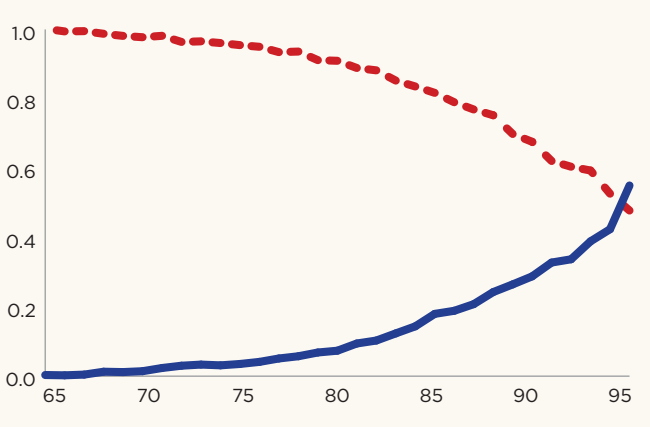


FIGURE 16. REGRESSION-ADJUSTED AGE PROFILE OF HOMEOWNERSHIP AND DIFFICULTY WITH MONEY MANAGEMENT



the regression results summarized in Tables 9 and 10. The columns in Table 9 indicate five different outcomes. The first is difficulty with managing money. The other four represent different (not necessarily mutually exclusive) housing and living arrangements: homeownership, co-residing with another adult (who is not a spouse/partner, and not in a nursing home), residing in a nursing home, and whether changed primary residences in the last two years. The focal measure of cognitive decline is a decrease in the total cognition score of one standard deviation, which is a value of 5.1, and is roughly equivalent to the decrease in the total cognition score from ages 65 to 95 shown in Figure 15. Each cell in the table shows the change in the outcome for a one-standard-deviation decline in the cognitive score from a separate regression. The regressions account for differences in individuals according to age and the same factors used to make the profiles shown in Figures 12–16: BMI, the number of limitations to physical mobility, the number of limitations to activities of daily living, and the presence of high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, arthritis, psychiatric conditions, calendar year, race, education, veteran status, employment, marital status, income, wealth, as well as any time-invariant unobserved differences between individuals.⁶ Each row in the table shows the relevant analysis sample.

⁶ Specifically, these estimates of the impact of cognition on the outcome are from a regression specification in which the outcome is modeled as a function of BMI, the number of limitations to physical mobility, the number of limitations to activities of daily living, and the presence of high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, arthritis, and psychiatric conditions, calendar-year effects, race, education, veteran status, marital status, income, and wealth, as well as single-year-of-age effects and the cognition measure. The model is estimated using a fixed-effects (within) estimator to account for time-invariant unobserved heterogeneity in the outcome. The identifying variation therefore comes from within individual across time changes in cognition that are independent of within individual across time changes in the other control variables.

For example, the first row of column 1 in panel A shows that over all individuals the estimated change in the probability of having difficulty in managing money for a one standard-deviation decline in the total cognition score is 0.033, or an increase of 3.3 percentage points. The double asterisk indicates that this effect is statistically different from zero at the 5% level of significance; a single asterisk indicates that this effect is statistically different from zero at the 10% level of significance. To get a sense of the economic significance of this estimate, the mean of the outcome in 1998, the base year for the estimation sample, is shown in square brackets. In 1998, 4.2 percent of individuals in the sample (i.e., homeowners, 65 and older, able to respond to the survey on their own) had difficulty managing money. A one standard-deviation decline in cognition, raises this to 7.5 percentage points (i.e., $4.2 + 3.3 = 7.5$). This is a substantial impact. The second and third rows show similar estimates for men and women separately; the fourth and fifth rows show similar estimates separately for the two most common marital statuses, married and widowed individuals, respectively. Across all subgroups, this form of cognitive decline is associated with a substantial increase in the likelihood of money-management issues.

Column 2 shows a parallel set of results when homeownership is the outcome. A one standard-deviation decline in total cognition is associated with a very small reduction in the likelihood of homeownership, between one-half of and one percentage point. Given that all individuals in the sample, by construction, began in 1998 as homeowners, this is a very small impact. Columns 3–5 show that this measure of cognitive decline is associated with modest increases in the likelihood of shared living arrangements, and more sizeable impacts on nursing home residence and mobility.

Since the memory and mental status tests that underlie the total cognition measure were only administered to those not in proxy interviews, this measure of decline does not apply to the most cognitively compromised. So, as an alternative, Table 10 summarizes regression results isomorphic to those in Table 9, but with a diagnosis of memory disease (since last interview) as an alternative measure of cognitive decline. Across all outcomes, memory disease is associated with statistically significant and economically sizeable changes in housing and living arrangements:

- An increase in the likelihood of having difficulty managing money of 26 percentage points;
- A decrease in the likelihood of remaining a homeowner of 6 percentage points;

- An increase in the likelihood of living in a shared arrangement of 1.2 percentage points;
- An increase in the likelihood of residing in a nursing home of 11.5 percentage points; and,
- An increase in the likelihood of a change in primary residence of 6.5 percentage points.

In addition, the largest effects are concentrated among widowed individuals.

Tables 11-12 repeat the analysis in Tables 9-10, but for two mortgage-related outcomes: incidence of a mortgage and, for those with a mortgage, whether ever fallen behind more than 2 months in mortgages payments in the last two years. In column 1 of both tables, the incidence of a mortgage in 1998, the base year, is shown in square brackets. For both

measures of cognitive decline and across all five subsamples of individuals, there is little relationship between cognitive decline and the incidence of a mortgage.

Since the HRS did not ask about mortgage delinquency until 2008, there is no base year value from 1998. Instead, the values in square brackets in column 2 of both tables represent the sample mean 60+ day delinquency rates for older homeowners with a mortgage across all years as a point of reference. For both measures of cognitive decline, there is a sizeable impact of cognition on delinquency. The effects are particularly large for a diagnosis of memory disease (Table 12). A diagnosis is associated with an increase in the 60+ delinquency rate of 13 percentage points, after accounting for health, mobility, demographic and economic characteristics in the regression analysis. The impacts of cognition on delinquency are pronounced for older women.

Conclusion

This report provides a statistical profile of housing, health, and cognition for a large, nationally representative sample of individuals ages 65 and older in 2012. Memory and cognition are fairly stable until the late 70s and then decline rapidly starting at about age 80. Cognitive decline is associated with small to modest changes in housing and living arrangements, with substantial impacts if the decline is associated with memory disease. Cognitive limitations affect the ability of some older Americans to manage their financial affairs and service mortgage debt.

These conclusions should be tempered by the following caveats. First, the analysis was limited to individuals 65 and older and, therefore, does not shed light on the role of cognition on decision-making for individuals less than 65 but beyond the age 53 peak estimated by Agarwal et al. (2009). Second, the analysis of cognitive decline relied on information gathered from the HRS respondents while they were alive. However, some of these respondents died and attrited from the sample in between waves of the survey, which occurred every two years. To the extent that much of both cognitive decline and changes in housing and living arrangements might occur in the last year or two of life and, therefore, are not observed in the HRS data on living respondents — there is essentially no evidence for or against this proposition in the economics literature — the estimates of the impact of cognitive decline on housing and living arrangements might be biased, although the direction of that bias is not clear a priori. This is clearly an avenue for further research. Finally, the “younger” old today already face a financial landscape that is more complex than the “older” old that are analyzed in the HRS sample in this analysis, which should generate some natural caution in extrapolating these findings to younger birth cohorts.

Looking forward, as increased longevity pushes many financial decisions to later ages, there is substantial interest in the extent to which cognition can be improved and decline forestalled. One pathway for this is the “use it or lose it” approach, in which more stimulating environments for older individuals, including the workplace, may help to preserve, and perhaps enhance, cognitive acuity. While this has been studied in a number of disciplines, Rohwedder and Willis (2010) have examined how retirement incentives built into government pension plans affect both retirement and cognition in a broad cross-section of developed countries. Their results suggest that pension policies that induce earlier departure from the labor force are associated with lower cognition in older individuals, and this effect appears to be causal. To the extent that Social Security reform were to raise the full-benefit age (currently 66) and private sector initiatives to retain older workers were to promote the employment rate of older individuals, then older Americans may be better able to “use it,” and both maintain cognitive acuity to older ages and promote sound financial decision-making in a growingly complex marketplace.

Tables

TABLE 1. SELECTED SUMMARY STATISTICS ON FINANCIAL CHARACTERISTICS FOR HOMEOWNERS 65 AND OLDER IN 2012 BY DEMOGRAPHIC CHARACTERISTICS, VETERAN, AND EMPLOYMENT STATUS. ALL DOLLAR FIGURES ARE MEAN IN 2012 DOLLARS, WITH MEDIANS IN SQUARE BRACKETS

SAMPLE	(1) HOUSING EQUITY	(2) INCOME	(3) WEALTH	(4) MORTGAGE DEBT	(5) ANNUAL MORTGAGE PAYMENTS
All Homeowners	187,373 [130,000]	59,159 [34,805]	590,051 [271,534]	125,951 [88,000]	14,743 [9,672]
A. By Race					
White	192,256 [140,000]	61,579 [35,928]	628,299 [302,567]	124,961 [90,000]	14,677 [9,870]
African-American	120,042 [75,000]	35,494 [22,499]	187,053 [96,007]	108,845 [70,000]	13,098 [9,144]
Other Races	202,048 [100,000]	45,925 [25,419]	440,879 [143,525]	185,087 [130,000]	19,754 [12,396]
B. By Marital Status					
Married	200,537 [150,000]	70,226 [43,581]	670,330 [329,235]	133,070 [96,000]	16,040 [10,656]
Separated/Divorced	158,854 [90,000]	38,983 [20,023]	416,654 [164,860]	140,125 [98,000]	14,237 [3,600]
Widowed	164,180 [110,000]	33,890 [20,074]	412,682 [189,007]	82,883 [58,000]	9,206 [11,096]
Never Married	149,309 [107,000]	51,430 [20,481]	562,585 [299,172]	93,139 [85,000]	8,707 [7,368]
C. By Education Group					
Less Than High School	111,681 [80,000]	31,285 [21,126]	251,473 [104,735]	76,111 [60,000]	10,073 [7,200]
High School Diploma	150,085 [120,000]	44,008 [30,839]	417,662 [222,319]	92,083 [70,000]	12,134 [8,400]
Some College and More	179,418 [137,000]	58,565 [37,735]	549,439 [290,929]	129,654 [96,000]	14,801 [10,200]
College Graduates	292,435 [200,000]	97,682 [54,431]	1,072,367 [584,768]	166,904 [118,000]	18,347 [12,000]

TABLE 1. SELECTED SUMMARY STATISTICS ON FINANCIAL CHARACTERISTICS FOR HOMEOWNERS 65 AND OLDER IN 2012 BY DEMOGRAPHIC CHARACTERISTICS, VETERAN, AND EMPLOYMENT STATUS. ALL DOLLAR FIGURES ARE MEAN IN 2012 DOLLARS, WITH MEDIANS IN SQUARE BRACKETS (CONTINUED)

SAMPLE	(1) HOUSING EQUITY	(2) INCOME	(3) WEALTH	(4) MORTGAGE DEBT	(5) ANNUAL MORTGAGE PAYMENTS
D. By Age Group					
Ages 65-69	183,703 [125,000]	74,500 [44,415]	590,130 [264,756]	124,122 [90,000]	15,908 [10,200]
Ages 70-74	187,602 [135,000]	61,785 [34,462]	587,520 [279,292]	131,074 [98,000]	13,820 [9,960]
Ages 75-79	192,957 [140,000]	48,350 [30,086]	615,532 [296,651]	123,447 [75,000]	14,261 [8,640]
Ages 80-84	204,988 [140,000]	46,905 [31,794]	655,958 [269,595]	124,176 [80,000]	13,218 [8,400]
Ages 85-89	166,650 [125,000]	36,429 [26,183]	457,962 [236,138]	112,099 [87,000]	8,529 [8,220]
Ages 90 and older	166,897 [110,000]	33,660 [23,274]	484,061 [252,139]	160,302 [65,000]	12,223 [7,200]
E. By Veteran Status					
Veteran	194,181 [145,000]	64,718 [41,273]	599,145 [305,318]	126,121 [90,000]	14,635 [10,200]
Non-Veteran	184,995 [130,000]	57,220 [32,320]	587,072 [262,806]	125,886 [87,000]	14,790 [9,600]
F. By Employment Status					
Employed	219,758 [140,000]	105,189 [62,189]	792,381 [331,659]	147,244 [100,000]	17,530 [11,736]
Not Employed	177,703 [130,000]	45,467 [30,571]	529,809 [256,988]	113,217 [80,000]	13,111 [9,324]

TABLE 2. SELECTED SUMMARY STATISTICS ON RENT, INCOME, AND WEALTH FOR RENTERS 65 AND OLDER IN 2012 BY DEMOGRAPHIC CHARACTERISTICS, VETERAN, AND EMPLOYMENT STATUS, ALL DOLLAR FIGURES ARE MEAN IN 2012 DOLLARS WITH MEDIANS IN SQUARE BRACKETS

SAMPLE	(1) INCOME	(2) WEALTH	(3) ANNUAL RENT	(4) MEDIAN ANNUAL RENT-TO-INCOME RATIO	(5) PERCENT WITH +30% RENT-TO-INCOME RATIO
All Renters	29,268 [18,050]	133,574 [4,880]	10,015 [7,200]	32%	51% —
A. By Race					
White	31,646 [19,166]	169,248 [9,892]	11,004 [7,500]	33%	52% —
African-American	20,013 [13,022]	8,072 [14]	6,719 [5,760]	31%	49% —
Other Races	24,864 [15,466]	33,981 [13]	7,086 [5,280]	31%	50% —
B. By Marital Status					
Married	46,573 [31,188]	292,481 [11,637]	12,033 [9,000]	28%	44% —
Separated/Divorced	21,485 [14,461]	40,937 [1,747]	6,765 [5,256]	31%	50% —
Widowed	23,642 [16,244]	98,064 [5,818]	11,867 [7,200]	41%	60% —
Never Married	24,406 [12,149]	92,074 [1,930]	7,209 [5,760]	27%	41% —
C. By Education Group					
Less Than High School	17,848 [12,801]	16,281 [97]	6,480 [4,848]	34%	54% —
High School Diploma	25,239 [17,700]	58,467 [6,788]	9,149 [6,720]	31%	50% —
Some College and More	34,853 [24,343]	131,109 [11,831]	10,998 [7,920]	30%	45% —
College Graduates	54,459 [33,457]	556,395 [99,886]	18,251 [12,000]	41%	56% —

TABLE 2. SELECTED SUMMARY STATISTICS ON RENT, INCOME, AND WEALTH FOR RENTERS 65 AND OLDER IN 2012 BY DEMOGRAPHIC CHARACTERISTICS, VETERAN, AND EMPLOYMENT STATUS, ALL DOLLAR FIGURES ARE MEAN IN 2012 DOLLARS WITH MEDIANS IN SQUARE BRACKETS (CONTINUED)

SAMPLE	(1) INCOME	(2) WEALTH	(3) ANNUAL RENT	(4) MEDIAN ANNUAL RENT-TO-INCOME RATIO	(5) PERCENT WITH +30% RENT-TO-INCOME RATIO
D. By Age Group					
Ages 65-69	34,197 [19,271]	73,769 [2,424]	7,462 [6,600]	27%	40% —
Ages 70-74	26,772 [18,050]	108,594 [2,429]	7,728 [6,600]	30%	48% —
Ages 75-79	23,724 [15,914]	124,752 [3,394]	8,413 [6,000]	33%	51% —
Ages 80-84	29,819 [16,874]	216,219 [10,667]	10,778 [7,500]	31%	50% —
Ages 85-89	27,438 [19,709]	158,062 [15,516]	14,491 [8,640]	48%	63% —
Ages 90 and older	31,692 [20,019]	225,697 [24,244]	19,297 [18,000]	52%	69% —
E. By Veteran Status					
Veteran	41,434 [29,842]	200,575 [11,637]	11,680 [9,000]	28%	44% —
Non-Veteran	26,059 [16,504]	115,987 [2,909]	9,562 [6,420]	33%	52% —
F. By Employment Status					
Employed	45,227 [33,942]	163,106 [9,604]	9,436 [8,400]	24%	33%
Not Employed	26,646 [16,839]	128,889 [4,266]	10,114 [6,600]	34%	54%

TABLE 3. SELECTED SUMMARY STATISTICS ON FUNCTIONAL STATUS AND HEALTH FOR HOMEOWNERS 65 AND OLDER IN 2012 BY DEMOGRAPHIC CHARACTERISTICS, VETERAN, AND EMPLOYMENT STATUS

SAMPLE	(1) PERCENT WITH PROXY INTERVIEW	(2) MEAN NUMBER OF HEALTH CONDITIONS	(3) MEAN BODY MASS INDEX	(4) MEAN NUMBER OF LIMITS TO MOBILITY	(5) PERCENT SELF-REPORTED IN FAIR OR POOR HEALTH	(6) NUMBER OF LIMITS TO ACTIVITIES OF DAILY LIVING
All Homeowners	4.6	2.5	27.7	1.2	24.3	0.3
A. By Race						
White	4.3	2.5	27.6	1.1	23.6	0.3
African-American	6.7	2.7	29.0	1.5	34.7	0.5
Other Races	8.3	2.4	27.8	1.1	30.4	0.3
B. By Marital Status						
Married	5.5	2.5	27.9	1.1	23.0	0.3
Separated/Divorced	1.2	2.6	27.9	1.2	25.7	0.3
Widowed	3.9	2.7	27.1	1.5	29.3	0.4
Never Married	1.0	2.4	27.0	1.1	24.3	0.2
C. By Education Group						
Less than High School	9.2	2.9	27.9	1.7	45.4	0.6
High School Diploma	4.3	2.6	27.9	1.2	24.5	0.3
Some College	3.7	2.5	28.0	1.2	21.8	0.3
College Graduates	3.2	2.2	27.1	0.8	14.9	0.2
D. By Age Group						
Ages 65-69	3.7	2.3	28.8	0.9	20.8	0.2
Ages 70-74	4.3	2.5	28.2	1.0	21.9	0.2
Ages 75-79	4.1	2.7	27.3	1.2	27.1	0.3
Ages 80-84	4.1	2.8	26.6	1.5	30.3	0.4
Ages 85-89	8.1	2.8	25.3	1.9	32.4	0.6
Ages 90 and Older	16.4	2.9	24.0	2.1	34.1	0.9
E. By Veteran Status						
Veteran	6.5	2.6	27.9	1.1	24.7	0.3
Non-Veteran	4.0	2.5	27.6	1.2	24.6	0.3
E. By Veteran Status						
Employed	3.5	2.1	28.0	0.6	11.0	0.1
Not Employed	5.0	2.7	27.6	1.3	28.7	0.4

TABLE 4. SELECTED SUMMARY STATISTICS ON THE INCIDENCE OF BRAIN DISEASE AND FUNCTION FOR HOMEOWNERS 65 AND OLDER IN 2012 BY DEMOGRAPHIC CHARACTERISTICS, VETERAN AND EMPLOYMENT STATUS

SAMPLE	(1) % WITH MEMORY DISEASE	(2) % WITH A STROKE	(3) % WITH PSYCHIATRIC OR MENTAL ILLNESS
All Homeowners	7.3	10.3	17.2
A. By Race			
White	7.2	10.2	17.4
African-American	8.5	11.8	13.9
Other Races	5.9	10.3	17.0
B. By Marital Status			
Married	5.0	9.9	15.4
Separated/ Divorced	6.0	11.1	25.1
Widowed	15.2	12.3	18.8
Never Married	6.2	5.5	20.7
C. By Education Group			
Less than High School	12.9	13.5	21.1
High School Diploma	6.1	10.7	16.3
Some College	8.3	9.9	17.6
College Graduates	4.6	8.4	15.6
D. By Age Group			
Ages 65-69	3.9	6.6	22.8
Ages 70-74	5.1	9.2	15.6
Ages 75-79	8.0	11.2	14.6
Ages 80-84	11.5	15.1	13.5
Ages 85-89	16.5	17.1	10.9
Ages 90 and Older	20.2	21.7	11.9
E. By Veteran Status			
Veteran	6.9	11.8	14.0
Non-Veteran	7.4	9.8	18.3
F. By Employment Status			
Employed	2.4	5.9	12.8
Not Employed	8.7	11.7	18.5

TABLE 5. SELECTED SUMMARY STATISTICS ON MEMORY AND COGNITION FOR HOMEOWNERS 65 AND OLDER IN 2012 BY DEMOGRAPHIC CHARACTERISTICS, VETERAN, AND EMPLOYMENT STATUS

SAMPLE	(1) PERCENT WITH SELF- RATED FAIR OR POOR MEMORY	(2) MEAN NUMBER OF IMMEDIATE RECALL WORDS	(3) MEAN NUMBER OF DELAYED RECALL WORDS	(4) MEAN NUMBER OF SERIAL SEVENS	(5) MEAN MENTAL STATUS SCORE	(6) MEAN TOTAL COGNITION SCORE
All Homeowners	27.9	5.2	4.2	3.6	12.7	22.2
A. By Race						
White	27.0	5.3	4.3	3.7	12.9	22.5
African-American	38.2	4.8	3.5	2.5	11.2	19.5
Other Races	30.1	4.9	3.9	3.2	11.9	20.6
B. By Marital Status						
Married	26.6	5.3	4.3	3.7	12.9	22.6
Separated/Divorced	27.5	5.5	4.5	3.4	12.7	22.7
Widowed	32.0	4.9	3.7	3.2	12.1	20.7
Never Married	29.7	5.3	4.5	3.6	12.8	22.6
C. By Education Group						
Less than High School	43.3	4.2	3.1	2.2	10.6	17.9
High School Diploma	30.3	5.1	4.1	3.5	12.7	21.9
Some College	25.3	5.4	4.5	3.8	13.0	22.9
College Graduates	17.7	5.8	4.9	4.2	13.7	24.4
D. By Age Group						
Ages 65-69	23.7	5.7	4.8	3.8	13.2	23.7
Ages 70-74	27.3	5.4	4.5	3.6	12.9	22.8
Ages 75-79	30.3	5.1	4.1	3.6	12.7	21.9
Ages 80-84	35.8	4.6	3.4	3.3	12.2	20.2
Ages 85-89	29.3	4.1	2.8	3.1	11.7	18.6
Ages 90 and Older	30.2	3.7	2.5	2.9	11.0	17.2
E. By Veteran Status						
Veteran	27.7	4.9	3.9	3.9	13.1	22.0
Non-Veteran	28.0	5.3	4.3	3.5	12.6	22.3
F. By Employment Status						
Employed	19.0	5.7	4.9	4.0	13.4	24.0
Not Employed	30.6	5.1	4.0	3.5	12.5	21.7

TABLE 6. SELECTED SUMMARY STATISTICS ON FUNCTIONAL STATUS AND HEALTH FOR RENTERS 65 AND OLDER IN 2012 BY DEMOGRAPHIC CHARACTERISTICS, VETERAN, AND EMPLOYMENT STATUS

SAMPLE	(1) PERCENT WITH PROXY INTERVIEW	(2) MEAN NUMBER OF HEALTH CONDITIONS	(3) MEAN BODY MASS INDEX	(4) MEAN NUMBER OF LIMITS TO MOBILITY	(5) PERCENT SELF-REPORTED IN FAIR OR POOR HEALTH	(6) NUMBER OF LIMITS TO ACTIVITIES OF DAILY LIVING
All Renters	7.8	3.0	27.8	1.9	41.7	0.7
A. By Race						
White	7.7	3.0	27.6	1.9	39.3	0.6
African-American	8.2	3.0	28.2	1.9	45.5	0.8
Other Races	7.3	3.3	28.8	2.3	59.8	0.9
B. By Marital Status						
Married	6.9	2.9	28.2	1.6	38.9	0.5
Separated/Divorced	5.5	3.0	28.3	1.9	42.8	0.6
Widowed	10.7	3.1	27.1	2.2	41.8	0.9
Never Married	4.8	2.9	27.9	1.7	47.1	0.7
C. By Education Group						
Less than High School	11.4	3.2	27.9	2.3	56.3	1.0
High School Diploma	6.8	3.1	27.9	1.9	38.1	0.6
Some College	4.6	2.9	27.9	1.8	35.4	0.6
College Graduates	6.9	2.6	26.9	1.4	27.3	0.5
D. By Age Group						
Ages 65-69	2.8	2.9	29.6	1.7	44.4	0.6
Ages 70-74	4.3	2.8	28.8	1.7	43.6	0.5
Ages 75-79	7.3	3.0	28.0	1.8	41.8	0.6
Ages 80-84	8.9	3.3	27.3	2.1	42.9	0.7
Ages 85-89	11.1	3.2	25.5	2.1	38.7	1.0
Ages 90 and Older	22.2	3.0	24.2	2.4	32.8	1.3
E. By Veteran Status						
Veteran	7.1	3.0	27.7	1.7	34.5	0.6
Non-Veteran	8.0	3.0	27.8	1.9	43.5	0.7
F. By Employment Status						
Employed	0.1	2.2	28.1	1.0	21.9	0.1
Not Employed	8.8	3.1	27.7	2.0	44.8	0.7

TABLE 7. SELECTED SUMMARY STATISTICS ON THE INCIDENCE OF BRAIN DISEASE AND FUNCTION FOR RENTERS 65 AND OLDER IN 2012 BY DEMOGRAPHIC CHARACTERISTICS, VETERAN, AND EMPLOYMENT STATUS

SAMPLE	(1) % WITH MEMORY DISEASE	(2) % WITH A STROKE	(3) % WITH PSYCHIATRIC OR MENTAL ILLNESS
All Renters	15.5	15.7	27.1
A. By Race			
White	15.3	15.3	27.7
African-American	14.3	19.5	17.4
Other Races	20.6	11.5	42.6
B. By Marital Status			
Married	7.7	13.6	22.5
Separated/ Divorced	12.1	16.7	29.0
Widowed	24.2	18.0	28.2
Never Married	11.6	8.8	30.9
C. By Education Group			
Less than High School	20.3	16.2	31.9
High School Diploma	15.4	18.2	27.7
Some College	11.2	14.1	22.7
College Graduates	11.2	10.3	20.8
D. By Age Group			
Ages 65-69	9.7	14.7	30.8
Ages 70-74	9.5	10.6	28.4
Ages 75-79	13.3	12.0	26.1
Ages 80-84	19.6	16.6	29.5
Ages 85-89	26.5	24.4	22.9
Ages 90 and Older	26.1	22.8	18.8
E. By Veteran Status			
Veteran	12.5	19.0	18.8
Non-Veteran	16.3	15.0	29.2
F. By Employment Status			
Employed	1.8	5.3	14.5
Not Employed	17.6	17.3	29.1

TABLE 8. SELECTED SUMMARY STATISTICS ON MEMORY AND COGNITION FOR RENTERS 65 AND OLDER IN 2012 BY DEMOGRAPHIC CHARACTERISTICS, VETERAN, AND EMPLOYMENT STATUS

SAMPLE	(1) PERCENT WITH SELF- RATED FAIR OR POOR MEMORY	(2) MEAN NUMBER OF IMMEDIATE RECALL WORDS	(3) MEAN NUMBER OF DELAYED RECALL WORDS	(4) MEAN NUMBER OF SERIAL SEVENS	(5) MEAN MENTAL STATUS SCORE	(6) MEAN TOTAL COGNITION SCORE
All Renters	35.7	4.6	3.5	2.9	11.6	19.8
A. By Race						
White	32.8	4.7	3.7	3.2	12.1	20.5
African-American	41.9	4.3	2.9	1.8	9.9	17.1
Other Races	54.4	4.1	3.1	2.0	10.3	17.4
B. By Marital Status						
Married	37.9	4.7	3.6	3.2	12.1	20.5
Separated/Divorced	38.0	4.8	3.7	2.8	11.5	20.0
Widowed	33.0	4.4	3.2	2.8	11.2	18.8
Never Married	34.4	5.0	3.9	3.2	12.2	21.1
C. By Education Group						
Less than High School	47.4	3.9	2.8	1.8	9.7	16.3
High School Diploma	31.5	4.7	3.7	3.1	11.9	20.3
Some College	32.4	5.1	4.0	3.5	12.6	21.6
College Graduates	25.7	5.2	4.1	4.2	13.5	22.8
D. By Age Group						
Ages 65-69	39.4	5.3	4.2	3.1	12.1	21.6
Ages 70-74	39.8	4.9	3.9	2.9	11.8	20.6
Ages 75-79	37.5	4.5	3.5	2.9	11.7	19.7
Ages 80-84	34.2	4.3	3.2	2.8	11.5	19.0
Ages 85-89	26.5	3.9	2.8	2.9	11.1	17.7
Ages 90 and Older	27.3	3.6	2.1	2.9	10.6	16.3
E. By Veteran Status						
Veteran	36.5	4.5	3.4	3.5	12.4	20.3
Non-Veteran	35.5	4.7	3.5	2.8	11.4	19.6
F. By Employment Status						
Employed	22.8	5.7	4.6	3.7	13.0	23.3
Not Employed	37.8	4.5	3.3	2.8	11.4	19.2

**TABLE 9. ESTIMATED IMPACT OF A ONE STANDARD DEVIATION DECLINE
IN THE TOTAL COGNITION SCORE ON HOUSING AND LIVING ARRANGEMENTS FOR 1998-2012**

SAMPLE	HOUSING OR LIVING ARRANGEMENT OUTCOME				
	(1) DIFFICULTY IN MANAGING MONEY	(2) HOME- OWNERSHIP	(3) SHARED LIVING ARRANGEMENT	(4) RESIDE IN NURSING HOME	(5) MOVED
All Individuals	0.033** [0.042]	-0.007** [1.000]	0.006** [0.121]	0.009** [0.004]	0.011** [0.061]
Men	0.027** [0.035]	-0.006** [1.000]	0.005** [0.085]	0.004** [0.003]	0.008** [0.064]
Women	0.037** [0.048]	-0.007** [1.000]	0.005** [0.149]	0.012** [0.005]	0.013** [0.058]
Married	0.025** [0.029]	-0.004** [1.000]	0.003* [0.054]	0.002** [0.002]	0.005* [0.056]
Widowed	0.047** [0.077]	-0.010** [1.000]	0.0002 [0.259]	0.022** [0.008]	0.024** [0.063]

**TABLE 10. ESTIMATED IMPACT OF REPORTED DIAGNOSIS OF MEMORY DISEASE
ON HOUSING AND LIVING ARRANGEMENTS FOR 1998-2012**

SAMPLE	HOUSING OR LIVING ARRANGEMENT OUTCOME				
	(1) DIFFICULTY IN MANAGING MONEY	(2) HOME- OWNERSHIP	(3) SHARED LIVING ARRANGEMENT	(4) RESIDE IN NURSING HOME	(5) MOVED
All Individuals	0.264** [0.042]	-0.062** [1.000]	0.012** [0.121]	0.115** [0.004]	0.065** [0.061]
Men	0.250** [0.035]	-0.054** [1.000]	0.025** [0.085]	0.077** [0.003]	0.031** [0.064]
Women	0.270** [0.048]	-0.068** [1.000]	0.003 [0.149]	0.138** [0.005]	0.084** [0.058]
Married	0.330** [0.029]	-0.038** [1.000]	0.008 [0.054]	0.083** [0.002]	0.021** [0.056]
Widowed	0.349** [0.077]	-0.126** [1.000]	0.058** [0.259]	0.225** [0.008]	0.164** [0.063]

TABLE 11. ESTIMATED IMPACT OF A ONE-STANDARD DEVIATION DECLINE IN TOTAL COGNITIVE SCORE ON MORTGAGE OUTCOMES FOR 1998-2012

SAMPLE	(1) HAVE A MORTGAGE	(2) DELINQUENT
All Individuals	-0.004** [0.195]	0.013* [0.050]
Men	-0.009** [0.216]	0.004 [0.044]
Women	-0.001 [0.179]	0.022** [0.056]
Married	-0.004 [0.209]	0.003 [0.035]
Widowed	-0.0007 [0.139]	0.050** [0.088]

TABLE 12. ESTIMATED IMPACT OF REPORTED DIAGNOSIS OF MEMORY DISEASE ON MORTGAGE OUTCOMES FOR 1998-2012

SAMPLE	(1) HAVE A MORTGAGE	(2) DELINQUENT
All Individuals	-0.006 [0.195]	0.132** [0.050]
Men	-0.020 [0.216]	0.071 [0.044]
Women	-0.004 [0.179]	0.173** [0.056]
Married	-0.019* [0.209]	0.107** [0.035]
Widowed	0.004 [0.139]	0.208 [0.088]

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