The Retirement Transition and Retirement-Savings Behaviors: Three Essays Analyzing Various Retirement Concerns Focusing on Military Veterans

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ABSTRACT

Retirement is a major life milestone that many hope to reach with adequate resources to last until the end. To know what amount is adequate, individuals need careful research and planning to understand their goals and what is required to accomplish those goals. Unfortunately, research finds that many individuals are not planning for retirement, are not saving enough, and are experiencing high out-of-pocket medical expenses that drain their resources. That individuals are experiencing high out-of-pocket medical expenses highlights the need to address poor physical and mental health outcomes post-retirement along with the lack of preparedness.

While health deterioration is a natural part of aging, researchers are interested in the association between retirement and various health outcomes. Because research indicates that veterans are at a higher risk of poor physical and mental health outcomes than civilians, especially in later years, this analysis is solely focused on veterans. The first and second essays examine the Health and Retirement Study (HRS) to analyze how the decision to exit the labor force completely is associated with physical and mental health capital. The first essay utilizes a probit model via maximum likelihood estimation to analyze binary indicators of physical health capital and finds that retirement is associated negatively with each measure of physical health capital. The second essay utilizes a probit model via maximum likelihood estimation to analyze binary indicators of mental health capital and finds that retirement is associated negatively with each measure of mental cognition but was not associated with either measure of depression in this sample.

Shifting the analysis towards retirement savings and preparedness, the final essay examines the National Financial Capability Study (NFCS) to analyze how financial literacy and financial education are associated with positive retirement-savings behaviors. Positive retirement-savings behaviors include having an employer-provided plan, having an individual retirement account, or having investments outside of retirement accounts. The third essay utilizes a probit model via likelihood estimation to analyze binary indicators for each of the retirement-savings behavior and finds that financial literacy and financial education are associated positively with each measure of retirement-savings behavior.

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CHAPTER I

INTRODUCTION

It is well documented that individuals who serve in the military are at a higher risk of experiencing negative health effects later in life. This may be due to the type of job they have in the military, and it also may be induced by certain negative health behaviors, such as smoking or drinking, that are prevalent in the military community. Those that serve in the military also are at a higher risk of suffering from mental-health-related problems because of their experiences during service. Additionally, the previous literature highlights the greater pre-mature mortality rate in the veteran community compared to the civilian community. This rate measures the number of deaths below the age of 75 and suggests that veterans are dying at a younger age, on average. While service in the military may present its own health-related issues, many of the older population of the United States (U.S.) may soon be experiencing health-related issues as they transition into retirement.

The decision to retire is said to depend on many factors including one's lifetime earnings, the present value of expected lifetime retirement income, and an individual's relative preference for household production time compared to market production time. The reason the retirement decision is of particular importance is because the research surrounding retirement's impact on an individual's overall health suggests that retirement may adversely affect overall health. Fortunately, the affects can be mitigated in some form or another. It is important for policy makers to understand the degree that retirement may influence physical and mental outcomes. This may help to determine whether there

is a need to further incentivize continued workforce participation or offer retirees other incentives to increase overall health and financial well-being.

In recent years, there has been a dramatic shift in the labor force composition in the U.S., as the Baby Boom generation began their journey into retirement around 2011. This significant shift of older individuals out of the labor force is going to have a profound impact on the Social Security system due to the structure of the program where younger workers essentially fund older workers' benefits. Because the fertility rate also has dropped in the U.S., there will be fewer young workers entering the labor force to help the Social Security system fund the large influx of retirees in the coming years. Thus, individuals may have to rely less on social security for their retirement needs.

The following three essays analyze how the decision to retire influences a respondent's mental and physical well-being and what factors are associated with positive retirement-savings behaviors. The first essay will examine the association between respondents' physical health and retirement decisions while controlling for other factors to see the role of retirement on late-life health issues. The second essay will examine the association between respondents' mental health and the retirement decision, controlling for other factors, to evaluate how the decision to exit the labor force can influence one's cognitive and mental abilities. Finally, the third essay will examine the association between financial literacy, financial education, and retirement-savings behavior. The first two research questions will be analyzed using seven of the most recent waves of the Health and Retirement Study (HRS), a panel study conducted on Americans ages 50 and older to examine retirement and health-related issues. The final research

question will be analyzed using the National Financial Capability Survey, a nationally representative survey of Americans.

This research aims to aid policy makers and financial planning practitioners in understanding the associations between retirement and an individual's physical, mental, and financial well-being. Policy makers can use this to adjust government incentive programs that encourage or discourage longer work lives. Financial planning practitioners can use the research to educate their clients on the advantages and/or disadvantages of retiring early or later, so they can help them make a more informed decision about when to exit or begin exiting the labor force. Financial planning practitioners also may use this research to encourage and provide a higher level of financial education to their clients.

CHAPTER II
PHYSICAL HEALTH AND THE RETIREMENT DECISION

Introduction

In 2019, the total U.S. civilian population aged 18 and above was slightly over 254 million, with roughly 17.4 million of those individuals being military veterans, according to the American Community Survey (U.S. Census Bureau, 2019). That is, veterans comprise about 7% of the U.S. population over the age of 18. Interestingly, the total veteran population has declined by approximately 20% over the period 2010 - 2019. This is not unexpected given that 94% of the veteran population in 2010 was aged 55 and above, compared to 4.22% in 2019. Previous studies also have shown that the premature mortality rate is higher for veterans than for nonveterans and has increased (Bedard and Deschenes, 2006). This rate measures the number of deaths below the age of 75 per 100,000 people and suggests that veterans are dying at a younger age, on average. Thus, a deeper understanding of the factors associated with various physical health outcomes of military veterans, including the transition to retirement, is needed.

Reasons for joining the military are numerous and unique for each person. Many people are motivated to join for reasons that include but are not limited to patriotism, access to better opportunities and benefits, education, travel opportunities, and family legacy. According to Becker (1962), joining the military is one form of human capital investment that may increase one's future well-being. Whatever the intentions, joining the military can provide an array of benefits and skills that extend beyond active duty. For example, healthcare benefits extend beyond active duty and reduce the burden of purchasing private health insurance when returning to civilian life. The number of

veterans utilizing the benefits provided by the Department of Veterans Affairs (VA), an organization that offers benefits designed to help improve the lives of veterans, has increased steadily over the years. In 2016, 48% of all veterans used at least one benefit or service provided by the VA, an increase in benefit usage of 10% since 2007 (NCVAS, 2017). Healthcare benefits account for the largest portion of benefits utilized among all veterans, followed by compensations and pensions. It is hypothesized that having access to organizations such as the VA increases veterans' reported level of health.

There are many reasons why additional research is needed to study the older population, both civilian and veteran. Of particular interest is the endogenous premature mortality rate of veterans. According to the National Center for Veterans Analysis and Statistics, veteran life expectancy in the U.S. was approximately 0.8 years shorter for males and 1.2 years shorter for females, when compared to the civilian population (NCVAS, 2017). However, it should be noted that longevity has been increasing for both women and men in the U.S. in general, though slightly more so for women than men (Xu et al., 2016).

Second, there is a large influx of individuals reaching retirement age as older people are expected to outnumber children for the first time in history by 2030 (U.S. Census Bureau, 2018). By this year, all baby boomers will be older than 65 years of age. This higher retirement cohort warrants additional research on retirement's potential association with an individual's health. Lastly, healthcare costs are continually increasing. One study projects that about one-tenth of retirees may need to allocate more than half of their total income towards out-of-pocket healthcare expenses (Goldman and

Zissimopoulos, 2003). To compound this issue, individuals are not saving adequately for retirement (Bernheim, 1992; Dugas, 2002; Munnell et al., 2006). According to research at the Pew Research Center, 38% of adults report that they are not confident that they will have enough income and assets for retirement (Pew Research, 2013).

Given these facts, examining the relationships between retirement and physical health outcomes can provide insights into whether programs available to retirees and veterans are successful, whether any improvements can be made, and in what areas. This study aims to analyze the intricacies of the relationship between respondents' health and their retirement decisions, specifically among veterans. By examining subjective and objective health measures while controlling for numerous factors such as physical activity and other health behaviors, this paper sheds light on the association between physical health and the decision to retire among service members.

Literature Review

In a seminal article, Becker (1962) set out to determine the economic impact of an investment in people. He proposed that economic agents seeking to maximize utility would invest both time and money to gain access to tangible and intangible resources that may increase future real income. Less tangible resources, rather than physical capital, such as on-the-job training, schooling, medical care, and acquiring information about the political and social system, have the potential to increase future real income (Becker, 1962). Investment in these various resources is said to be an investment in one’s human capital.

Joining the military is an example of how an individual can invest in his/her human capital (Becker, 1962; Acemoglu and Lyle 2004; Lee, 2007). An individual can receive training paid for by the employer, the government, and his/her benefits are received upon discharge when those learned skills can transfer into higher-paying jobs in the civilian sector (Becker, 1962). There have been many studies to determine whether joining the military has the potential to increase future real income. For example, Angrist and Krueger (1994) use an instrumental variable approach to determine whether World War II veterans earned more than their nonveteran counterparts did. Using census data from 1960, 1970 and 1980, they find that WWII veterans did not earn more than nonveterans did and may, in fact, have earned less. In contrast, Lee (2007) analyzes Civil War-era veterans to determine how military service affected their post-service occupation. An instrumental variable approach is used to correct for potential omitted-variable bias. The results show that occupational mobility and the potential to earn more income depend largely on one's experiences while in service.

Whether serving in the military may influence one's future real income, it has been shown to affect other areas of life adversely. Many studies have examined the impact that military service can have on an individual's health. One study conducted by Bedard and Deschenes (2006) analyzes data from the National Longitudinal Mortality Survey and the National Center for Health Statistics to determine whether the premature mortality rate is higher for veterans than for nonveterans. They find a long-run higher premature mortality rate for veterans compared to nonveterans. Two significant causes seemed to be heart disease and lung cancer. McKinney et al. (1997) examine data from

the National Medical Expenditure Survey and find that veterans have a higher likelihood of smoking than nonveterans do. Additionally, serving in the military has been shown to have profound adverse effects on mental health, which can lead to adverse effects on one's overall health (McFall et al. 1991; Hodge et al. 2004; Prince et al. 2004).

On the subject of health, Becker finds that improving one's emotional and physical health is another form of investment in human capital (1962). Constructing a demand function for health capital, Grossman (1972) assumes that individuals are born with an initial stock of health, which deteriorates with age at an increasing rate. However, one's stock of health is maintained or increased through an investment in health capital. The author finds that the demand for health increases with higher levels of educational attainment and higher wage rates but decreases with age and income. He also finds that the demand for medical care increases with age, income, and family size. An individual's stock of health capital will determine the amount of time available to produce and consume market and household goods. In much of the literature, health capital is measured by the number of sick days an individual has per year, month, or week. Those with a significant number of sick days are said to have low levels of health capital, which can impact one's market and household production directly, given the decrease in time available. As stated in Mushkin (1962), there is an inverse relationship between income and the time lost at work from sick days.

Prior studies often have focused on the impact poor health has on the decision to retire. One study by McGarry (2004) utilizes the Health and Retirement Study (HRS) to determine whether subjective health measures are good indicators of the decision to retire

and how these subjective measures compare to alternative health measures such as mortality rates, activity limitations, and diagnosis of disease. The author finds that poor health, whether reported subjectively or through alternative measures, is a significant factor in the decision to retire, more so than income or wealth. Other studies suggested that health is a more significant factor than income or wealth. In another study, Bazzoli (1985) finds that economic variables such as incomes or pensions have a more significant influence on the decision to retire than health.

Many other studies have determined there may be justification bias involved when analyzing data with self-reported health variables (Parsons, 1982; Anderson and Burkhauser, 1985; Dwyer and Mitchell, 1999). Justification bias tends to occur when analyzing respondents' subjective self-assessment of their physical health capacity. For example, respondents who enjoy working may postpone retirement and tend to exaggerate their health outlook. In contrast, those who dislike working may retire sooner and tend to downplay their health outlook. In this case, the estimates may be biased in the direction of retirement driving poorer health outcomes. Researchers suggest analyzing subjective and objective health measures such as a doctor's diagnosed illness to account for this.

While many studies have observed how health outcomes can influence the decision to retire, few have examined the opposite. That is, how is the decision retire associated with an individual's health status? Given that retirement is associated with an increase in time available for household and leisure activities, researchers are interested in whether this time is used to invest in a person's health capital. Dave et al. (2008)

analyze 1992-2005 HRS data to determine the effects that retirement can have on indicators of physical and mental health. They find that full retirement can have adverse effects on an individual's physical and mental health status. However, those adverse effects can be mitigated through physical activity, continued social interaction, marriage, or continued part-time employment. Another study finds that changes to physical-health outcomes after retirement are not statistically significant; however, changes to mental-health outcomes after retirement are statistically significant (Mein et al. 2003). Several studies show that many individuals will experience a decline in mental and physical health upon reaching retirement age (Grossman, 1972; Moen, 1996; Herzog and Morgan, 1991). On the contrary, other researchers suggest that a reduction in work-related stress, accompanied by an increase in leisure activities in retirement, can lead to an increase in one's perceived well-being and mental health but not necessarily an increase in physical strength (Neuman, 2008, Johnston and Lee, 2009).

With health as a major concern, the population aging, and the recent increase of retired individuals, it becomes ever more important to study the effects that retirement will have on an individual's overall well-being. Much of the literature has highlighted the gradual decline in the average retirement age and the accompanying rise in the retirement community (Gendell and Siegel, 1992; Costa, 1998; Purcell, 2000; Gendell, 2001). Many studies find that the baby-boomer generation will continue their large transition into retirement and become increasingly reliant on Social Security and the personal wealth that they have accumulated (Dohm, 2000; Coleman, 2006; Lusardi and Mitchell, 2007). This makes research in the field of personal finance more relevant than ever as

practitioners aim to guide those in or near retirement through the distribution phase of the life cycle.

As health-care costs continue to rise, health-care expenditures can become one of the largest expenses during retirement. Many studies have analyzed the rising trend of health-care costs and their impact on the retirement community (Johnson and Penner, 2004; Skinner, 2007; Munnell et.al, 2008). Large and unexpected health expenditures in the early stages of retirement can significantly impact a household's financial well-being. In fact, many individuals often underestimate the amount of healthcare expenditures they will have in retirement (Hoffman and Jackson, 2013).

To compound the issue, longevity also has been increasing over the past few decades, a little more so for women than for men. This increase in longevity will cause a strain on an individual's retirement savings considering they must stretch their savings to cover these additional years if they are unplanned (Bloom et. al, 2004; Cutler, 2011; Cocco and Gomes, 2012). Fortunately, there are financial products to assist with many of these issues outlined above. However, they will not be the focus of this research.

The contribution of this paper is to extend the research on the influence of retirement on an individual's physical health to the veteran community (Moen, 1996; Herzog and Morgan, 1991; Mein et al., 2003; Dave et al., 2008; Neuman, 2008, Johnston and Lee, 2009). The goal is to extend the analysis of retirement's effects on veterans' health outcomes by analyzing seven waves of the Health and Retirement Study (HRS) from 2004 to 2018.

Data

The data used in this analysis are derived from the Health and Retirement Study (HRS), a nationally representative longitudinal study of older Americans above the age of 50. The survey is conducted by the Institute for Social Research (ISR) and the Survey Research Center (SRC) at the University of Michigan and is supported by the National Institute on Aging (NIA) and the Social Security Administration (SSA). It is intended to provide detailed economic information on health, retirement, and other microeconomic variables for researchers to analyze health- and retirement-related issues of older Americans.

HRS surveys six core areas including health, health services, labor force participation, economic status, family structure, and expectations. Questions regarding labor force and economic status examine factors such as earnings, income by source, employment status, wealth by asset type, and consumption, among others. Questions concerning participants' families are used to explore family composition such as marital status and number of children. Finally, questions concerning health, health services, and future expectations are utilized to examine personal characteristics that may affect the respondent's overall health capital.

The RAND Center for the Study of Aging provides a user-friendly version of the HRS data which is made public through the HRS website. The longitudinal files are funded and supported by the National Institute on Aging (NIA) and the Social Security Administration (SSA). The files contain cleaned and processed variables that are labeled and described in more detail than the raw HRS data. The 2018 RAND HRS files are

derived from all waves of the HRS data and contain most of the original variables from the HRS survey. This analysis makes use of waves 7 - 14 of the HRS data to examine the association between the retirement decision and respondents' overall physical-health outcomes between the years 2004 and 2018.

The number of person-waves in this analysis is 30,802. The average age of the respondents is around 64 years. Forty-eight percent of the sample is retired and forty-five percent report being married.

Dependent Variables

The dependent variables used in this analysis are various objective and subjective health measures. Three objective health measures are based on responses to questions about whether the respondent had any heart problems, difficulties with Activities of Daily Living (ADLs), or stokes during each of the wave years. To analyze each of these health outcomes, a binary indicator variable is created such that a value of one represents good health. Thus, the variable for no heart problems is = 1 if the respondent did not report having heart problems and = 0 if the respondent did report having heart problems in each of the wave years. The variable for no ADLs is = 1 if the respondent has no difficulties with ADLs and = 0 if the respondent has difficulties with one or more ADLs, in each of the wave years. The variable for no strokes is = 1 if the respondent did not have a stroke and = 0 if the respondent did have a stroke, in each of the wave years.

The subjective measure of the respondent's health is a binary indicator = 1 if the respondent has very good or excellent health and = 0 if the respondent has poor, fair, or good health. The binary subjective health indicator is created to focus on respondents

who are in the two highest health outcomes. Previous literature has suggested to use caution when analyzing self-assessed health responses because certain types of people tend to over-or-under estimate their health. For example, veterans may be less likely than non-veterans to admit they are in poor health, resulting in a larger percentage of veterans excellent health. To account for this justification bias, this analysis will include an indicator variable for overall health = 1 if the respondent has no heart problems, no difficulties with ADLs, and no strokes and = 0 if the respondent has heart problems, difficulties with ADLs, or having a stroke. The overall health variable is expected to correct for justification bias by removing the respondent's self-assessment of health and examining overall good health in terms of not any of the three objective health measures simultaneously. Although respondents may report having good health, they also may report having heart problems or having a stroke, so the variable is created to capture any bias that may be present.

Table 1.1 shows the weighted sample means of the dependent variables used in the analysis, along with the standard errors and confidence intervals. As can be seen, 46% of the veteran sample has good health. Additionally, 77% of veterans have no heart problems. Regarding difficulties with ADLs, 84% of the veteran sample do not have any difficulties with ADLs. Furthermore, 94% of the sample did not have a stroke throughout the analysis. Lastly, the overall health variable used to account for justification bias shows that 65% of the veteran sample has good health. One conclusion that can be drawn is that heart problems are more prevalent than difficulties with ADLs and strokes in this sample. As seen with the overall health indicator, veterans in this sample may be

overstating poor health outcomes. Only 46% are in good health for their self-assessment, while more than 65% are in good health based on the objective measures.

Explanatory variables

The primary independent variable in this analysis is whether the respondent is fully retired from the labor force. Respondents who are not in the labor force due to a disability are excluded because their health is already compromised prior to analysis. The respondents are asked if they consider themselves not retired, completely retired, or partially retired. A dichotomous variable is created and coded so that retirement = 1 if the respondent is completely retired and = 0 if the respondent is not retired or partially retired. Being not retired or partially retired are grouped into the same category because, in either case, the respondent is still in the labor force. The primary concern of this analysis is the association between fully exiting the labor force and physical health capital. Once a respondent has indicated complete retirement, the variable is = 1 for the remaining waves of the analysis.

According to consumer demand theory, individuals are constrained by their resources, including labor and non-labor income. A continuous variable for income is created as the sum of the respondent's labor earnings, pension income, social security income, and investment earnings. To control for the budget constraint, the natural logarithm of income is used and will analyze the semi-elasticity of income on the response probability for health capital investment.

Other socioeconomic factors included in the regression include the respondent's gender, race, marital status, and level of education. An indicator variable is created and =

1 if the respondent is male and = 0 if the respondent is female. Indicator variables are created for each race to account for whites, blacks, Hispanics, and other races. The variables are coded and = 1 if the respondent is that specific race and = 0 otherwise. Whites will serve as the reference category for race. For marital status, an indicator variable is created and = 1 if the respondent is married and = 0 otherwise. For education, an indicator variable is created and = 1 if respondents report having 16 or more years of schooling and = 0 otherwise. Respondents with 16 or more years of schooling are considered to have a bachelor's degree or higher and are said to be more efficient producers of health capital (Grossman, 1972).

Regarding health behaviors, an indicator variable is created to account for whether the respondent is a smoker. The variable is coded as 0 = non-smoker and 1 = smoker and considers their current smoking status. Often, smoking is used as a proxy for risk because it portrays the individual's need for immediate gratification without regard for the future. To control for the respondent's level of drinking, a categorical variable is created from a variable measuring how many alcoholic beverages per day the respondent drinks, ranging from zero to seven. The categorical drinking variable is coded as 0 = non-drinker, 1 = moderate drinker has 1 – 3 drinks per day, and 2 = has four or more drinks a day. According to the National Institute on Alcohol Abuse and Alcoholism, individuals are considered heavy drinkers if they consume four or more drinks per day. A dummy variable is created for each drinking category, and non-drinkers will serve as the reference category for alcoholic drinking levels. Alcohol consumption also is used as a

proxy for risk in the literature and thus must be accounted for when examining the health status of respondents (Dave et al., 2008).

Other health-related variables included are the presence of health insurance and the respondent's body mass index (BMI). The BMI is the ratio of a person's weight in kilograms to that person's height in meters squared. It is calculated from the self reported measures of height and weight and is converted meters and kilograms by the administers of the survey. An indicator varaiable is created and = 1 if the respondent's BMI is greater than 30, which is considered obese according to the National Heart, Lung, and Blood Institute, and = 0 otherwise. Whether the respondent is covered by health insurance is included as an indicator variable such that 0 = not covered and 1 = covered by some form of health insurance. Individuals with health insurance often are forward-looking and may invest more in their health capital, increasing their overall health.

According to the human capital model for the demand for health, a major factor that influences a person's health is how often and how rigorously that person is physically active (Grossman, 1972). To control for physical activity, an indicator variable is created from a categorical variable that measures a respondent's level of physical activities. For the original categorical variable, 0 = no physical activity, 1 = physical activity 1 -3 times per month, 2 = physical activity once per week, 3 = physical activity more than once per week, and 4 = physical activity every day. Due to the lack of variation in each of the categories, the indicator variable is created and = 1 if the respondent is physically active more than once a week or every day and = 0 otherwise.

Descriptive statistics

Table 1.2 provides descriptive statistics for all the explanatory variables used in this analysis. About 49% of veterans in this sample are retired. Ninety-eight percent of the veteran respondents are male. The average amount of income for veteran respondents is around $48,400. About 82% of respondents are married. Only about 24% of veterans in this sample are college-educated. Eighty-nine percent of veterans in this sample are white, blacks account for 8% of the sample, Hispanics about 3%, and people of other races account for only 2%. Regarding health insurance coverage, about 63% of the respondents have health insurance. Concerning health behaviors, about 26% of veterans in this sample are in the obese category for BMI. Additionally, around 20% of veterans are smokers, 26% are moderate drinkers, and about 18% are heavy drinkers. Lastly, about 55% of veterans engage in frequent physical activity.

Model

Given the discrete nature of the dependent variables, this paper estimates the following probit model via maximum likelihood on each of the five health outcomes:

$$Health_{ij}^{*} = \beta_0 + \beta_1 Retirement_{ij} + \beta_2 HealthBehaviorsV_{ij} + \beta_3 LnIncome_{ij}$$

$$+\beta_4 DV_{ij} + \beta_5 TD_{ij} + u_{ij},$$

$$u_{ij} = \alpha_i + e_{ij}$$

$$e_{ij} \sim N(0,1)$$

where $Health_{ij}^{*}$ is an unobserved latent variable representing the net benefit a respondent receives from having good health. The observability conditions are:

$$Health_{ij} = \begin{cases} 1 & \text{if } Health_{ij}^{*} > 0 \ (Good\ Health) \\ 0 & \text{if } Health_{ij}^{*} \leq 0 \ (Poor\ Health) \end{cases}$$

The observable outcomes for the health variables are represented by $Good\ Health$, $Overall\ Health$, $No\ ADL\ Difficulties$, $No\ Heart\ Problems$, and $No\ Stroke$. These observable outcomes are related to the latent unobservable measures $Good\ Health_{ij}^{*}$, $Overall\ Health_{ij}^{*}$, $No\ ADL\ Difficulties_{ij}^{*}$, $No\ Heart\ Problems_{ij}^{*}$, and $No\ Stroke_{ij}^{*}$ through the observability conditions above. The subscripts i and j represent the respondent and the wave, respectively. Recall that the time between each wave is two years as per the administration of the survey. The composite error term, u_{ij}, consists of the idiosyncratic error term, e_{ij}, that are assumed to follow a standard normal distribution and a person-specific effect, α_i, that are assumed to be invariant across waves. Robust standard errors are calculated to account for heteroscedasticity, or non-constant variance, across respondents. Additionally, each regression contains a time dummy variable for each wave to capture the unobserved factors that may affect the respondent's health at a point in time.

The primary explanatory variable, $Retirement_{ij}$, is included to examine the association between a respondent's health and the decision to exit the labor force completely. Two main arguments concerning the association between retirement and health arise in the literature. The first is that retirement leads to an increase in health, given an increase in leisure time available. The second is that it leads to a decline in health, given a lack of social interaction and a sense of purpose. The research supports both sides of the argument, with some arguing that retirement has a negative association with your health (Grossman, 1972; Moen, 1996; Herzog and Morgan, 1991; Dave et al.,

2008) and others claiming it has a positive association (Neuman, 2008; Johnston and Lee, 2009). According to Grossman's theory of health-capital investment, investments in health capital can increase the time available to earn money in the labor market and to produce and consume commodities with remaining time. Upon retirement, the investment motive to produce money earnings is no longer present; thus, retirement is expected to be associated negatively with good health outcomes.

The variable $HealthBehaviorV_{ij}$ is a matrix of explanatory variables to control for health-related factors that may be associated with an individual's health outcomes. It includes variables representing whether the respondent is covered by health insurance, a smoker, level of drinking, BMI level, and level of physical activity. The variable, $Hcovered_{ij}$, is included to account for whether the respondent is covered by any form of health insurance. Medical care is said to be an input in the production function of the commodity "good health" (Grossman, 1972). Because access to medical care is an input in the production function of health capital, it is included in the analysis. It is hypothesized that having health insurance is associated positively with good health outcomes, as the demand for health insurance is derived from the demand for the commodity "good health".

The explanatory variable, $Smoker_{ij}$, is included to examine the association between smoking and the respondent's reported health outcomes. The variable, $DrinkBehavior_{ij}$, is included to examine the association between different levels of alcohol consumption and the respondent's reported health outcomes. Smoking and drinking are said to be market inputs into the gross investment function of the commodity

"health". It is hypothesized that smoking is associated negatively with health outcomes because of its inherent risk to one's health. Additionally, it is hypothesized that drinking heavily will be associated negatively with good health outcomes due to its inherent medical risk to one's health.

The explanatory variable $PhysicalActivity(PA)_{ij}$ is included to control for and examine the associations between remaining physically active and physical health outcomes. According to the theory of health-capital investment, physical activity is an investment in health capital and can help to improve one's stock of health. Therefore, it is hypothesized that $FrequentPA_{ij}$ is associated positively with good physical health outcomes compared to those that do not report frequent physical activity. The variable $ObeseBMI_{ij}$ also is included to control for respondents' health behaviors associated with their overall health capital. It is hypothesized that those have an $ObeseBMI_{ij}$ is associated negatively with good physical health outcomes compared to those that do not fall within the obese category.

The variable $LnIncome_{ij}$ is included and represents the log of the respondent's income. According to the theory of demand, higher income allows an individual's budget line to shift up and to the right. This allows him/her to purchase more commodities such as "good health." Thus, it is hypothesized that income is associated positively with the probability of good health outcomes.

Lastly, DV_{ij} is a matrix of explanatory variables representing a respondent's demographic characteristics such as gender, race, education, and marital status. It has been shown in the research that health outcomes are better on average for married

individuals compared to non-married individuals (Dave et al., 2008). Therefore, it is hypothesized that being $Married_{ij}$ is associated positively with good health outcomes compared to not being married. According to Grossman (1972), changes in human capital, as measured by college education, can influence the marginal product of health capital investment which can shift the supply and demand of health capital. Thus, being $CollegeEducated_{ij}$ is included in the analyses and is hypothesized to be associated positively with good health outcomes compared to not being college-educated. The variables $Male_{ij}$, $Black_{ij}$, $Hispanic_{ij}$, and $OtherRace_{ij}$ are included to control for the biological factors that have been shown to be associated with health outcomes (Gallant and Dorn, 2001; Rieker and Bird, 2005). Table 1.3 lists the hypothesized sign for each explanatory variable on the dependent variables.

Results

The marginal effects of retirement on the latent dependent variables $Good\ Health_{ij}^{*}$, $Overall\ Health_{ij}^{*}$, $No\ ADL\ Difficulties_{ij}^{*}$, $No\ Heart\ Problems_{ij}^{*}$, and $No\ Stroke_{ij}^{*}$ are presented in Table 1.4. The key result of this analysis is that retirement is associated negatively with each of the five dependent physical health measures. Results indicate that retirement is associated with a 0.12 lower probability of having overall good health and a 0.10 lower probability of not having any difficulties with ADLs. When looking at the subjective measure of health, retirement is associated with a 0.08 lower probability of having good health. Results show that retirement is associated with a 0.04 lower probability of not having heart problems and a 0.05 lower probability of not having

a stroke. The far-right column of Table 1.4 is an analysis of possible endogeneity between retirement and physical health outcomes. It may be that the decision to retire is motivated by poor health outcomes, which may cause the relationship to be exaggerated. Thus, the analysis is restricted to respondents that indicate that health is not affecting or limiting their paid work. The results show that even after accounting for possible endogeneity, the decision to retire is associated negatively with physical health outcomes, although the magnitudes are less than when not controlling for it. As shown, retirement is associated with a 0.05 lower probability of having good health and a 0.09 lower probability of having good overall health. Additionally, retirement is associated with a 0.04 lower probability of not having any difficulties with ADLs and a 0.03 lower probability of not having a stroke.

The marginal effects of the remaining explanatory variables on physical health outcomes are presented in Table 1.5. The marginal effects of the explanatory variables for the restricted sample accounting for engogeneity are presented in Table 1.6. The results indicate that income is associated positively with four of the five good physical health measures. According to consumer demand theory, if income increases and the demand for a good increases, that good is considered a normal good. The evidence suggests that good physical health is a normal good. As shown at the top of Table 1.5, a one percent increase in income is associated with a 0.02 higher probability of good health, all else held constant. For the objective health measures, a one percent increase in income is associated with a 0.01 higher probability of having overall good health and a 0.02 higher probability of not having any difficulties with ADLs. For the restricted

sample in Table 1.6, a percent increase in income is associated with a 0.02 higher probability of having good health and a 0.01 higher probability of not having any difficulties with ADLs.

Regarding health behaviors, being obese, having health insurance, smoking, drinking, and engaging in physical activity are all significantly associated with being in good health. Being obese is associated with a 0.10 lower probability of having good health, compared to those who are not obese. Additionally, being obese is associated with a 0.02 lower probability of being in overall good health and a 0.05 lower probability of not having any difficulties with ADLs. For the restricted sample, being obese is associated with a 0.10 lower probability of having good health and 0.04 lower probability of not having any difficulties with ADLs.

Having health insurance is shown to be associated positively with having good health, overall good health, and no difficulties with ADLs. Having health insurance is associated with a 0.03 higher probability of having good health, a 0.02 higher probability of having overall good health, and a 0.04 higher probability of not having any difficulties with ADLs, compared to those who do not have insurance. For the restricted sample, having health insurance is associated with a 0.02 higher probability of having good health, a 0.03 higher probability of having overall good health, and a 0.02 higher probability of not having any difficulties with ADLs.

Interestingly, moderate and heavy drinking are associated positively with good physical health outcomes. Moderate drinkers and heavy drinkers have a 0.05 and 0.04 higher probability, respectively, of having good health compared to non-drinkers.

Moderate drinkers have a 0.05 higher probability of having overall good health and a 0.06 higher probability of not having difficulties with ADLs, compared to non-drinkers. Heavy drinkers have a 0.03 higher probability of having overall good health and a 0.04 higher probability of not having any difficulties with ADLs. Regarding the restricted sample, moderate drinking is associated positively with good health, no difficulties with ADLs, and not having a stroke. Heavy drinking is associated positively with good health and not having a stroke. It is likely that the drinking variable and the smoking variable are highly associated with a set of unobservable factors that influence the association in this unexpected manner.

Smoking is associated negatively with good health and not difficulties with ADLs; however, the association is positive when looking at overall good health, not having heart problems, and not having a stroke. Smokers have a 0.09 lower probability of having good health and a 0.03 lower probability of having no difficulties with ADLs, compared to non-smokers. Additionally, smokers have a 0.02 higher probability of having overall good health and a 0.03 higher probability of not having heart problems compared to non-smokers. For the restricted sample, smoking is associated with a 0.10 lower probability of having good health and a 0.03 higher probability of having good overall health. Again, it is likely due to the unobserved factors associated with smoking.

As expected, the level of physical activity a respondent engages in is associated positively with most measures of physical health. This variable is significant across all models except for no heart problems. Respondents who engage in frequent physical activity have a 0.05 higher probability of having good health, compared to those who do

not engage in frequent physical activity. Respondents who engage in frequent physical activity have a 0.05 higher probability of overall good health, a 0.08 higher probability of no difficulties with ADLs, and a 0.02 higher probability not having a stroke, compared to those who do not engage in frequent physical activity. For the restricted sample, engaging in frequent physical activity is associated with a 0.04 higher probability of good health, a 0.04 higher probability of overall good health, a 0.05 higher probability of no difficulties with ADLs, and a 0.02 higher probability of not having a stroke.

Looking at the demographic variables in the bottom half of Table 1.5, being male is associated negatively with physical health outcomes compared to females. Being male is associated with a 0.09 lower probability of having overall good health, a 0.03 lower probability of not having heart problems, and a 0.02 lower probability of not having a stroke, compared to females. For the restricted sample in Table 1.6, males are associated with a 0.08 lower probability of having good health and a 0.08 lower probability of having overall good health compared to females. From Table 1.5, having a college education is associated with a 0.14 higher probability of having good health, a 0.08 higher probability of having good overall health, a 0.05 higher probability of no difficulties with ADLs, and a 0.02 higher probability of not having a stroke compared to those without a college education. For the restricted sample, having a college education is associated with a 0.14 higher probability of having good health and a 0.03 higher probability of no difficulties with ADLs compared to those without a college education.

Concerning race, blacks are associated with a 0.06 lower probability of being in good health; however, they are associated with a 0.07 higher probability of reporting

overall good health and a 0.03 higher probability of not having heart problems compared to whites. Hispanics are assoiciated with a 0.05 lower probability of good health but a 0.10 higher probability of overall good health and a 0.03 higher probability of not having heart problems compared to whites. People of other race are associated with a 0.05 lower probability of being in good health and 0.05 lower probability of no difficulties with ADLs, compared to whites. For the restricted sample, being black is associated with a 0.07 lower probability of having good health, being Hispanic is associated with a 0.11 lower probability of having good health, and being other race is associated with a 0.05 lower probability of good health compared to whites.

Conclusions

Analyzing 7 waves of the Health and Retirement Study (HRS) that span from 2004 to 2016, this paper examines how the retirement decision influences an individual's physical health outcomes among the veteran community. This analysis confirms prior research, which suggests that retirement is negatively associated with positive health outcomes (Dave et al., 2008). The results indicate that the retirement decision significantly influences respondents' investment motive for good physical health in this sample. The association between the decision to retire and physical health outcomes is negative for veterans, regardless of the measurement. Results indicate that veterans in this sample may be underscoring their health outlook and it is beneficial to analyze subjective and objective measures. Health is considered a normal good, having health insurance can influence positively physical health outcomes. Remaining physically active at least more than once a week can assist in the production of health capital. As predicted, more

educated respondents are more efficient producers of health capital. It is also important to factor in the possibility of reverse causality between health and the retirement decision.

The following chapter will shift the examination to analyze how retirement may influence an individual's mental health and what factors may help to influence positively the respondent's mental health.

Tables: Chapter II

Table 2.1: Dependent Variable Weighted Means

	Mean	Standard Error	95% Confidence Interval	
Health status				
Good Health	0.4672	(0.0037)	0.4599	0.4745
No Difficulties w/ADLs	0.8559	(0.0026)	0.8509	0.8610
No Heart Problems	0.7230	(0.0032)	0.8424	0.8524
No Stroke	0.9375	(0.0018)	0.9340	0.9409
Overall Health	0.6451	(0.0036)	0.6381	0.6521
N = 19,493				

Note: Data are for individuals ages 50 – 75 compiled from waves 7 – 14 of the RAND Health and Retirement Study (HRS) Longitudinal File 2018 (v1). Sample and stratification weights are used to adjust for the oversampling of African American and Hispanic respondents.

Table 2.2: Descriptive Statistics of Explanatory Variables

Independent Variables (Reference Category)	**Mean**	**(Standard Error)**
Retired	0.4952	(0.0030)
(Not Retired)		
Income	$48,358	($555.26)
Married	0.8257	(0.0026)
(Not Married)		
College Educated	0.2363	(0.0025)
(No College)		
Male	0.9812	(0.0008)
(Female)		
Race		
(White)		
Black	0.0727	(0.0013)
Hispanic	0.0289	(0.0008)
Other	0.0192	(0.0008)
BMI – Obese	0.2563	(0.0030)
(Not Obese)		
Health Insurance Coverage	0.6302	(0.0035)
(No Health Insurance)		
Smoker	0.1957	(0.0027)
(Non-Smoker)		
Drinking Behavior		
(Non-Drinker)		
Moderate drinker	0.2596	(0.0036)
Heavy drinker	0.1834	(0.0032)
Frequent Physical Activity	0.5457	(0.0063)
(No Frequent Physical Activity)		
N = 22,852		

Note: Data are for individuals ages 50 – 75 compiled from waves 7 – 14 of the RAND Health and Retirement Study (HRS) Longitudinal File 2018 (v1). Sample and stratification weights are used to adjust for the oversampling of African American and Hispanic respondents. Number of observations differ for each variable.

Table 2.3: Hypothesized sign of Explanatory Variables

Independent Variables	Good Health Outcomes
Retirement	(-)
LogIncome	+
Married	+
College Educated	+
Male	(-)
Blacks	(-)
Hispanics	(-)
Other Race	(-)
BMI	(-)
Health Insurance Coverage	+
Smokers	(-)
Moderate Drinkers	(-)
Heavy Drinkers	(-)
Frequent Physical Activity	+

Table 2.4: Marginal Effects of Retirement on Physical Health Outcomes

Dependent Variable Explanatory Variable	**Random Effects**	**Health Not A Limiting Factor**
Good Health		
Retirement	**- 0.0818***** (0.0097)	**- 0.0507***** (0.0122)
No ADL Difficulties		
Retirement	**- 0.0980***** (0.0078)	**- 0.0367***** (0.0068)
No Heart Problems		
Retirement	**- 0.0462***** (0.0065)	**- 0.0456** (0.0772)
No Strokes		
Retirement	**- 0.0524***** (0.0043)	**- 0.0348***** (0.0054)
Overall Health		
Retirement	**- 0.1170***** (0.0126)	**- 0.0907***** (0.0215)

Note: Standard errors are in parenthesis.
***p < 0.01, **p < 0.05, *p < .10

Table 2.5: Marginal Effects of Explanatory Variables on Physical Health Outcomes

Dependent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
	Good Health	**Overall Health**	**No ADL Difficulties**	**No Heart Problems**	**No Stroke**
Explanatory Variables (Reference Category)					
LnIncome	**0.0229*** **	**0.0137*** **	**0.0190*** **	**0.0014**	**0.0044*** **
	(0.0041)	(0.0030)	(0.0027)	(0.0025)	(0.0011)
BMI - Obese	**- 0.0953*** **	**- 0.0216** **	**- 0.0521*** **	**- 0.0003**	**0.0112*** **
(Not Obese)	(0.0100)	(0.0093)	(0.0081)	(0.0068)	(0.0030)
Health Insurance	**0.0298*** **	**0.0221*** **	**0.0354*** **	**0.0042**	**0.0039**
(No Health Insurance)	(0.0087)	(0.0074)	(0.0071)	(0.0059)	(0.0029)
Smoker	**- 0.0902*** **	**0.0223***	**- 0.0325*** **	**0.0314*** **	**0.0088***
(Non-Smoker)	(0.0126)	(0.0127)	(0.0101)	(0.0061)	(0.0049)
Moderate Drinker	**0.0508*** **	**0.0458*** **	**0.0551*** **	**0.0088**	**0.0123*** **
(Non-Drinker)	(0.0092)	(0.0086)	(0.0071)	(0.0066)	(0.0034)
Heavy Drinker	**0.0449*** **	**0.0347*** **	**0.0429*** **	**0.0053**	**0.0144*** **
(Non-Drinker)	(0.0127)	(0.0126)	(0.0093)	(0.0087)	(0.0045)
Frequent Physical Activity	**0.0467*** **	**0.0533*** **	**0.0840*** **	**0.0060**	**0.0165*** **
(No Physical Activity)	(0.0075)	(0.0064)	(0.0062)	(0.0049)	(0.0026)
Male	**- 0.0430**	**- 0.0883*** **	**0.0252**	**- 0.0322*** **	**- 0.0175*** **
(Female)	(0.0282)	(0.0323)	(0.0227)	(0.0079)	(0.0065)
Married	**0.0083**	**0.0251***	**0.0477*** **	**0.0125**	**0.0124*** **
(Not Married)	(0.0117)	(0.0134)	(0.0096)	(0.0086)	(0.0036)
College Educated	**0.1392*** **	**0.0843*** **	**0.0542*** **	**0.0224*** **	**0.0002**
(No College Education)	(0.0140)	(0.0204)	(0.0102)	(0.0075)	(0.0036)
Blacks	**- 0.0624*** **	**0.0737*** **	**- 0.0102**	**0.0345*** **	**0.0014**
(Whites)	(0.0152)	(0.0217)	(0.0121)	(0.0076)	(0.0042)
Hispanics	**- 0.0530** **	**0.0969** **	**0.0048**	**0.0329** **	**0.0111***
(Whites)	(0.0278)	(0.0384)	(0.0222)	(0.0128)	(0.0067)
Other Race	**- 0.0554** **	**0.0253**	**- 0.0535** **	**0.0247***	**- 0.0016**
(Whites)	(0.0264)	(0.0389)	(0.0223)	(0.0139)	(0.0068)
	n = 4,227	**n = 4,178**	**n = 4,179**	**n = 4,223**	**n = 4,225**

Note: Standard errors are in parenthesis
***p < 0.01, **p < 0.05, *p < .10

Table 2.6: Marginal Effects of Explanatory Variables on Physical Health Outcomes (Health Not a Limiting Factor)

Dependent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
	Good Health	**Overall Health**	**No ADL Difficulties**	**No Heart Problems**	**No Stroke**
Explanatory Variables (Reference Category)					
LnIncome	**0.0234*** **	**0.0096** **	**0.0115*** **	**0. 0005**	**0.0051*** **
	(0.0053)	(0.0044)	(0.0025)	(0. 0029)	(0.0013)
BMI - Obese	**- 0.1010*** **	**- 0.0111**	**- 0.0407*** **	**0.0024**	**0.0113** **
(Not Obese)	(0.0133)	(0.0151)	(0.0080)	(0.0092)	(0.0047)
Health Insurance	**0.0240** **	**0.0298*** **	**0.0202*** **	**0.0095**	**0.0055**
(No Health Insurance)	(0.0114)	(0.0105)	(0.0069)	(0.0145)	(0.0043)
Smoker	**- 0.1008*** **	**0.0347** **	**- 0.0131**	**0.0194**	**0.0062**
(Non-Smoker)	(0.0176)	(0.0178)	(0.0096)	(0.0300)	(0.0072)
Moderate Drinker	**0.0431*** **	**0.0198**	**0.0308*** **	**0.0122**	**0.0107** **
(Non-Drinker)	(0.0118)	(0.0112)	(0.0065)	(0.0172)	(0.0045)
Heavy Drinker	**0.0291** **	**- 0.0021**	**0.0127**	**0.0085**	**0.0106** **
(Non-Drinker)	(0.0159)	(0.0188)	(0.0087)	(0.0140)	(0.0057)
Frequent Physical Activity	**0.0431*** **	**0.0380*** **	**0.0530*** **	**0.0080**	**0.0175*** **
(No Physical Activity)	(0.0099)	(0.0081)	(0.0063)	(0.0122)	(0.0037)
Male	**- 0.0842** **	**- 0.0753** **	**0.0291**	**- 0.0247**	**- 0.0220**
(Female)	(0.0352)	(0.0351)	(0.0217)	(0.0079)	(0.0167)
Married	**- 0.0027**	**0.0241**	**0.0231** **	**0.0026**	**0.0046**
(Not Married)	(0.0155)	(0.0222)	(0.0091)	(0.0125)	(0.0059)
College Educated	**0.1368*** **	**0.0483**	**0.0302*** **	**0.0046**	**- 0.0023**
(No College Education)	(0.0162)	(0.0460)	(0.0079)	(0.0161)	(0.0060)
Blacks	**- 0.0705*** **	**0.0768** **	**0.0012**	**0.0219**	**0.0008**
(Whites)	(0.0196)	(0.0452)	(0.0106)	(0.0318)	(0.0074)
Hispanics	**- 0.1119** **	**0.0620**	**- 0.0059**	**0.0154**	**- 0.0060**
(Whites)	(0.0345)	(0.0611)	(0.0187)	(0.0314)	(0.0109)
Other Race	**- 0.0549** **	**0.0482**	**- 0.0140**	**0.0170**	**- 0.0010**
(Whites)	(0.0337)	(0.0661)	(0.0192)	(0.0299)	(0.0122)
	n = 3,173	**n = 2,962**	**n = 2,965**	**n = 3,167**	**n = 3,171**

Note: Standard errors are in parenthesis
***p < 0.01, **p < 0.05, *p < .10

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CHAPTER III
MENTAL HEALTH AND THE RETIREMENT DECISION

Introduction

The state of an individual's mental health is just as important as the state of his/her physical health at every stage in the life cycle. One's mental health status is a vital factor in determining the quality of his/her decision making in everyday life. Unfortunately, mental-health issues are becoming increasingly common today. In 2014, nearly 20% of older Americans experienced a mental-health issue and 4% of Americans lived with a serious mental illness such as major depression or schizophrenia (MentalHealth.gov, 2017). According to the National Institute of Mental Health, depression is one of the most prevalent mental illnesses among adults in America (2019). These illnesses and others like them can impact many aspects of an individual's life negatively and have been shown to compound other problems such as poor physical health, poor financial behaviors, and minimal social interaction (Dave et al., 2008). The number of individuals who are diagnosed with issues related with mental health continues to rise, especially now as America experiences the current pandemic. Thus, it is increasingly important to examine the symptoms and factors that influence these problems so that preventative measures can be taken in a timely manner.

Research has shown that the world's population is aging rapidly. The proportion of the population over the age of 60 is expected to nearly double in the next couple of decades, according to the World Health Organization (WHO, 2018). WHO reports also that over 20% of adults over the age of 60 suffer from some sort of mental or neurological disorder (2018). Research analyzing the relationship between retirement and

mental health contains mixed findings with some researchers postulating that it has a positive association and others contending that it has a negative association. The research supporting positive assosiations highlights the increase in leisure time available and the lower level of work-related stress that allows for a better mental health outcome (Mein et al., 2003). The research addressing negative aspects discuss how lower social interactions and lack of purpose after retiring from the labor force which leads to a decline in mental health outcomes (Dave et al., 2008). As mental-health awareness continues to rise, the research surrounding mental-health related problems and its influence on various matters of life will continue to grow (Minkler, 1981; Dave et al., 2008; Bogan & Fertig, 2018). Knowing that mental-health problems are widespread throughout the U.S., this analysis is particularly interested in the mental-health of older Americans in or near retirement, paying special attention to the veteran community.

According to the U.S. Department of Veterans Affairs, the suicide rate for civilians and veterans increased significantly between 2005 and 2016 by 21% and 26% respectively (2018). In 2016, the suicide rate for veterans was 1.5% higher than for non-veterans. The same study reported that veteran suicide for the elderly is higher than non-veteran suicide. Thus, this analysis examines the association between the decision to retire and mental-health problems, focusing on the veteran respondents.

As mental-health problems are rising in the United States for both veterans and non-veterans, another aspect to consider is that a large number of people are shifting into retirement. According to Fichtner (2012), the percentage of people claiming social security at the age of 62 has increased to 35%. Although the system is structured so that

an individual may receive a small increase in his/her social security benefit for each month he/she waits to claim beyond full retirement age, more and more people are choosing to retire early. The decision to retire early should consider the length of time one is planning to be in retirement to ensure there are sufficient resources available to fund ones needs. However, research shows that people are not saving enough for retirement and not accounting for large unexpected health expenditures (Bernheim, 1992; Dugas, 2002; Munnell et al., 2006).

Considering the large influx of retirees and widespread mental health issues among the older population, this study aims to enrich the literature on the association between the retirement transition and mental health outcomes for the veteran population by analyzing five mental health measures. Two measures represent depressive symptoms, and three measures represent mental cognition levels. This study analyzes seven waves of the Health and Retirement Study (HRS) between 2004 and 2018 and includes 26,365 person-wave observations.

Literature Review

Much of the early literature focused on how an individual's health status influenced their voluntary or involuntary decision to retire (Anderson and Burkhauser, 1985; Bound, 1989; McGary, 2004). One study conducted by Dwyer and Mitchell (1999) utilizes the Health and Retirement Study (HRS) to examine the effects of health and other economic variables on the decision to retire. Controlling for both subjective and objective measures, the authors find that an individual's health status is a significant factor in the decision to retire, more so than economic variables such as income or net worth. While it

has been well documented that an individual's health status has profound implications for the decision to retire, research examining the relationship between the decision to retire and one's health status has increased.

Whether retirement is associated positively or negatively with health continues to be investigated. On one side, researchers provide evidence that not participating in the labor force would make retirees' health worse off (Miller, 1965; Henry, 1971; Seiden, 1981; Dave et al., 2008). On the other, researchers provide evidence that retirement leads to a healthier life (Atchley, 1971, 1993; Mindanik et al., 1995; Nadler et al., 1997; Drentea, 2002; Mein et al., 2003). Regarding the former, Dave et al. (2008) utilize seven longitudinal waves of the Health and Retirement Study (HRS) to examine the association between retirement and physical- and mental-health outcomes. To correct for unobserved heterogeneity, the authors estimate a fixed-effects model on a sample of retirees with no pre-existing health problems prior to retirement. The authors find that complete retirement is associated with a 6–9% decrease in mental-health status. Regarding the latter, Mein et al. (2003) analyze longitudinal data on civil servants to determine whether early retirement is associated with improvement or deterioration in mental and physical health. The authors find that mental-health functioning improved among those who retired compared to those who continued to work; however, improvements to mental-health functioning was limited to high salary employees.

Previous studies exploring the relationship between retirement and health have included various demographic variables such as gender, education, and race to examine their role in the production of health capital. Richardson and Kilty (1995) use

longitudinal data to examine gender differences in mental health before and after retirement. After gathering data from various organizations, businesses, and institutions in the Central Ohio area, they found that retired people were more likely to report drinking problems and psychological anxiety for both men and women. In another study by Reuser et al. (2011), the authors analyze seven longitudinal waves of the HRS to examine whether higher education can influence cognitive impairment. They find that higher levels of education are associated negatively with longer periods of cognitive impairment and that the influence of education is more substantial among ethnic minorities. More specifically, black men and women live longer with cognitive impairment than white and Hispanic men and women.

While the existing literature has examined mental-health differences across various demographic groups in retirement, few have studied the differences between veterans and non-veterans. According to Becker (1962), individuals seeking to increase their future real income should invest in their human capital as long as the marginal benefit exceeds the marginal cost. Becker explains how joining the military is one form of human-capital investment that has the potential to increase one's future real earnings capabilities. Examining the assumption that military service increases income opportunities, one study shows that military service did not increase earnings potential (Angrist and Krueger, 1994), while another study finds that it can increase earnings potential, depending on the occupation, experience, and rank while in service (Lee, 2007).

Serving in the military also could affect other aspects of life adversely. Many studies have examined the relationship between military service and an individual's mental health (Hoge et al. 2006; Boscarino, 2006; Whyman et al., 2011). For example, Anderson and Mitchell (1992) analyze data from the National Institute of Mental Health (NIMH) Epidemiological Catchment Area (ECA) program to examine the direct and indirect relationship of military service on mental health and labor market outcomes. Using a two-stage model, the authors find that military service is associated positively with alcoholism, drug abuse, and other conditions found in the Diagnostic and Statistical Manual of Mental Disorders-III (DSM-III). However, they find no statistically significant differences in the existence of depression among service members compared to civilians. Another study conducted by Britton et al. (2011) use the 2006 Behavioral Risk Factor Surveillance System survey and a multivariate logistic regression to examine the prevalence, correlates, and symptom profiles of depression in men with military service. The authors find that men who served had a similar prevalence of depression and depressive symptoms to those men who had not served in the military.

As the literature shows, depression and other issues related to mental health are prevalent in both the veteran and non-veteran communities. Therefore, it is increasingly important to understand how an individual's mental-health status can affect other areas of life. One study by Siegel et al. (2004) examines two waves of the HRS and uses multivariate regression models to determine the impact of spousal depressive symptoms on respondents' depressive symptoms. The authors suggest that respondents with a

spouse who reported having depressive symptoms are more likely to report having depressive symptoms in the near future.

The contribution of this paper is to extend the research examining the relationship between retirement and mental health to the veteran community. Much of the prior literature analyzes other sociodemographic characteristics such as education, gender, and race. Hence, there is an opportunity to shift the focus. The goal is to extend the analysis of retirement and mental-health outcomes to the veteran community by analyzing seven waves of the Health and Retirement Study (HRS) that span from 2004–2018.

Data

The data used in this analysis are derived from the Health and Retirement Study (HRS), a nationally representative longitudinal study of older Americans over age 50. The survey is conducted by the Institute for Social Research (ISR) and the Survey Research Center (SRC) at the University of Michigan and is supported by the National Institute on Aging (NIA) and the Social Security Administration (SSA). It is intended to provide detailed economic information on health, retirement, and other microeconomic variables for researchers to analyze older Americans' health- and retirement-related issues.

HRS surveys six core areas including health, health services, labor-force participation, economic status, family structure, and expectations. Questions regarding labor-force and economic status examine factors such as earnings, income by source, employment status, wealth by asset type, and consumption, among other variables. Questions about the participants’ families are used to explore family structure. Finally,

questions about health, health services, and future expectations are utilized to examine personal characteristics that may affect the respondent's overall health capital.

The RAND Center for the Study of Aging provides a user-friendly version of the HRS data which is made public through the HRS website. The longitudinal files are funded and supported by the National Institute on Aging (NIA) and the Social Security Administration (SSA). The files contain cleaned and processed variables that are labeled and described in more detail than the raw HRS data. The 2018 RAND HRS files are derived from all waves of the HRS data and contain most of the original variables from the HRS survey. This analysis will make use of wave 7–14 of the HRS data to examine the association between retirement and mental-health outcomes between the years 2004 and 2018.

The number of observations in this sample is 29,036 person-waves, examined across seven waves of the HRS study. Of the sample, 98% are males, and 2% are females. The average age of the respondents is around 63. Fortey-nine percent are considered fully retired and 29% are college-educated.

Dependent variable

The dependent variables used in this analysis is a measure of the respondents' level of depression and their mental cognition score to analyze the associations between the decision to retire and mental health outcomes. It is widely accepted in the literature to use the Center for Epidemiology Studies Depression (CES-D) scale as a reliable measure when analyzing symptoms of depression among study participants (Irwin et al., 1999; Dave et al., 2008). The original CES-D scale rates a respondent's depression level on a

range from 0 to 20, where 0 indicates no depressive symptoms reported and 20 indicates all depressive symptoms are reported.

The HRS uses a shorthand version of the CES-D, which consists of eight questions related to depressive symptoms and is shown in the literature to be a reliable measure of depression (Dave et al., 2008). This analysis will sum the responses to eight questions regarding the symptoms of depression, resulting in a depression scale ranging from 0 to 8, with higher scores representing higher levels of depression. Table 2.1 shows the mean and standard error of the depressive symptoms used. From the table, it can be seen that the largest area of concern is the sleep quality of respondents with almost 26% of the sample "restless sleep" followed by "everything being an effort" with 17% this as an issue.

Table 2.2 displays the CES-D score, which is the sum of the reported answers from Table 2.1 above. As can be seen, more than half of the sample or 53% did not report any symptoms of depression and less than 2% of the sample reported having all eight symptoms of depression. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) classifies the severity of depressive symptoms between mild, moderate, and severe. According to the manual, an individual is considered to have severe depression if they report four or more depressive symptoms. Thus, the score is re-categorized into a dichotomous indicator variable so that if the respondent has four to eight symptoms, they are considered "Severely Depressed" and coded as zero. If the respondent has less than four symptoms, they are considered "Not Severely Depressed" and coded as one. Another

indicator variable for depression is analyzed and = 1 if the respondent has no depressive symptoms and = 0 otherwise.

This analysis also examines another mental-health score, which measures a respondent's total cognitive abilities. The HRS measures total cognition by summing the scores of multiple mental-health-status tests and a total-word-recall test. The mental-health score is created from a combination of five tests, including a serial 7s test (subtracting by seven from 100), counting backward (10 continous numbers from 20), object naming (scissors and cactus), date recall (date, month, year, day of the week), and naming of the president and vice president. For the serial 7s test, they are given five attempts to correctly subtract by seven which would allow for a total of five points. They are given two attempts at counting backwards from 20, correctly naming two objects, and correctly naming the president and vice president for a total of six points, or two points for each task. For date recall, they are given a point for each correct response to the following: year, month, day, and day of the week, for a total of four points. This mental-health score ranges from 0 to 15 and is combined with the total 20-word recall score resulting in a total cognition score ranging from 0 to 35 with higher numbers representing better overall mental cognition.

According to the DSM-5, neurocognitive disorders exist on a spectrum between major or mild symptoms. Individuals are considered to have a major neurocognitive disorder if they fall two or more standard deviations below the norm and considered to have mild cognitive decline if they fall between one and two standard deviations below the norm. For this analysis, the mean of the total cognition score, 22 correct answers, is

considered to be the norm. The standard deviation of the score is 5 answers. Thus, a dichotomous indicator variable for not having major or severe cognitive decline is created and takes a value of 0 if the respondent answers 17 or less correctly and takes the value of 1 if the respondent answers 18 or more correctly. The analysis also examines those with above average mental cognition. This variable takes the value of 0 if the respondent answers 23 or less correct and takes the value of 1 if the respondent answers 24 or more correct. Lastly, to examine those with "excellent mental health," an indicator variable is created and = 1 if the respondent answers 28 or more correct and = 0 otherwise. This variable captures mental cognition scores one or more standard deviations above the norm. These measurments are chosen to analyze various levels of mental cognition as suggested by previous research.

Table 2.3 displays the weighted sample means and standard errors for the dependent variables used in this analysis. Only about 9% of this sample report having severe depressive symptoms and about 57% have no depressive symptoms. Looking at the mental cognition measures, nearly 92% do not have moderate or severe cognitive decline and about 62% have above average mental cognition.

Explanatory variables

Prior studies often have examined how an individuals' health status may affect their decisions to retire (Belgrave et al., 1987; Dwyer and Mitchell, 1999). In contrast, this study analyzes how retirement can affect an individual's mental health given an increase in available time for nonmarket or household production. Studies have shown

that retirement can have adverse effects on an individual's overall health (Dave et al., 2008; Behncke, 2012).

The primary independent variable in this analysis is whether the respondent is fully retired. Respondents who are not in the workforce due to a disability are excluded because their health is already compromised prior to analysis. The respondents are asked if they consider themselves not retired, completely retired, or partially retired. A dichotomous variable is created and coded so that retirement = 0 if the respondent is not retired or partially retired, and retirement = 1 if the respondent is completely retired. not retired or partially retired are grouped into the same category because, in either case, the respondent is still in the labor force. The primary concern of this analysis is the association between fully exiting the labor force and physical health capital. Once a respondent has indicated retirement, the variable is = 1 for the remaining waves of the analysis.

According to consumer demand theory, individuals are constrained by their resources, including labor income and non-labor income. A continuous variable for income is created as the sum of the respondent's labor earnings, pension income, social security income, and investment earnings. The natural logarithm of income is used to control for the budget constraint and describes the semi-elasticity of income on the response probability of health capital investment.

Other socioeconomic factors included in the regression include the respondent's gender, race, marital status, presence of children, and level of education. An indicator variable is created and = 1 if the respondent is male and = 0 if the respondent is female.

Indicator variables are created for each race to account for whites, blacks, Hispanics, and other races. The variables are coded and = 1 if the respondent is that specific race and = 0 otherwise. Whites will serve as the reference category for race. For marital status, an indicator variable is created and = 1 if the respondent is married and = 0 otherwise. For education, an indicator variable is created and = 1 if respondents report having 16 or more years of schooling and = 0 otherwise. Respondents with 16 or more years of schooling are considered to have a bachelor's degree or higher and are said to be more efficient producers of health capital (Grossman, 1972).

Regarding health behaviors, an indicator variable is created to account for whether the respondent is a smoker. The variable is coded as 0 = non-smoker and 1 = smoker based on the respondent's current smoking status. Often, smoking is used as a proxy for risk because it portrays the individual's need for immediate gratification without regard for the future. To control for the respondent's level of drinking, a categorical variable is created from a variable measuring how many alcoholic beverages per day the respondent drinks, ranging from zero to seven. The categorical drinking variable is coded as 0 = non-drinker, 1 = has 1 – 3 drinks per day, and 2 = has four or more drinks a day. According to the National Institute on Alcohol Abuse and Alcoholism, individuals are considered heavy drinkers if they consume four or more drinks per day. A dummy variable is created for each drinking category, and non-drinkers will serve as the reference category for alcoholic drinking levels. Alcohol consumption also is used as a proxy for risk in the literature and thus must be accounted for when examining the health status of respondents (Dave et al., 2008).

Other health-related variables included are the presence of health insurance and the respondent's body mass index (BMI). The BMI is the ratio of a person's weight in kilograms to that person's height in meters squared. An indicator varaiable is created and = 1 if the respondent's BMI is greater than 30 which is considered obese according to the National Heart, Lung, and Blood Institute, and = 0 otherwise. Whether the respondent is covered by health insurance is included as an indicator variable such that 0 = not covered and 1 = covered by some form of health insurance. Individuals with health insurance often are forward-looking and may invest more in their health capital, increasing their overall health.

According to the human capital model for the demand for health, a major factor that influences a person's health is how often and how rigorously that person is physically active (Grossman, 1972). To control for physical activity, an indicator variable is created from a categorical variable that measures a respondent's level of physical activities. For the original categorical variable, 0 = no physical activity, 1 = physical activity 1 -3 times per month, 2 = physical activity once per week, 3 = physical activity more than once per week, and 4 = physical activity every day. Due to the lack of variation in each of the categories, the indicator variable is created and = 1 if the respondent is physically active more than once a week or every day and = 0 otherwise.

Descriptive statistics

Table 2.4 provides descriptive statistics on all the explanatory variables used in this analysis. As shown, about 49% of the veterans in this sample are retired. Males comprise 98% of the veteran respondents. The average amount of income for veteran

respondents is around $48,400. About 82% of respondents are married. For education, only about 24% of veterans in this sample have a college education. Whites comprise about 88% of veterans in this sample, blacks about 9%, Hispanics about 3%, and people of other races only 2%. Regarding health insurance coverage, about 63% of the respondents have health insurance. Concerning health behaviors, about 24% of veterans in this sample are in the obese category for BMI. Additionally, around 20% of veterans are smokers, 26% are moderate drinkers, and about 18% are heavy drinkers. Lastly, about 55% engage in frequent physical activity.

Model

Given the discrete nature of the dependent variables, this paper estimates the following probit model via maximum likelihood on each of the five health outcomes:

$$MentalHealth_{ij}^{*} = \beta_0 + \beta_1 Retirement_{ij} + \beta_2 HealthBehaviorsV_{ij} + \beta_3 LnIncome_{ij}$$

$$+\beta_4 DV_{ij} + \beta_5 TD_{ij} + u_{ij},$$

$$u_{ij} = \alpha_i + e_{ij}$$

$$e_{ij} \sim N(0,1)$$

where $MentalHealth_{ij}^{*}$ is an unobserved latent variable measuring the respondent's mental health. The observability conditions are:

$$MentalHealth_{ij} = \begin{cases} 1 & \text{if } MentalHealth_{ij}^{*} > 0 \ (Good\ Mental\ Health) \\ 0 & \text{if } MentalHealth_{ij}^{*} \leq 0 \ (Poor\ Mental\ Health) \end{cases}$$

where $MentalHealth_{ij}$ is the observed measure of mental health. The observable outcomes for the mental health variables are represented by $No\ Severe\ Depression$, $No\ Depression$, $No\ Moderate\ or\ Severe\ Cognitive\ Decline$,

$Above\ Average\ Mental\ Cognition$ and $Excellent\ Mental\ Cognition$. These observable outcomes are related to the latent unobservable measures $No\ Severe\ Depression_{ij}^{*}$, $No\ Depression_{ij}^{*}$, $No\ Mod/Sev\ Cog.Decline_{ij}^{*}$, $Above\ Avg.Mental\ Cognition_{ij}^{*}$, and $Excellent\ Mental\ Cognition_{ij}^{*}$ through the observability conditions above. The subscripts i and j represent the respondent and the wave, respectively. Recall that the time between each wave is two years as per the administration of the survey. The composite error term, u_{ij}, consists of the idiosyncratic error term, e_{ij}, that are assumed to follow a standard normal distribution and a person-specific effect, α_i, that is assumed to be invariant across waves. Robust standard errors are calculated to account for heteroscedasticity, or non-constant variance, across respondents. Additionally, each regression contains a time dummy variable for each wave to capture the unobserved factors that may affect the respondent's health over time.

The primary explanatory variable $Retirement_{ij}$ is included to examine the impact that retirement has on a respondent's mental health status. There are two main arguments surrounding the association between retirement and health which are: that it leads to an increase in health, given an increase in leisure time available, or that it leads to a decline in health, given the lack of social interaction and sense of purpose. The research supports both sides of the argument with some arguing that retirement has a negative effect on your health (Grossman, 1972; Moen, 1996; Herzog and Morgan, 1991) and others claiming it has a positive effect (Neuman, 2008; Johnston and Lee, 2009). Retirement is expected to be associated negatively with excellent mental cognition due to the loss of mentally engaging activities in the labor force. Additionally, retirement is

expected to be associated negatively with not having severe depression (Dave et al., 2008; Behncke, 2012).

The variable $LnIncome_{ij}$ is included and represents the log of the respondent's income. According to the theory of demand, higher income allows an individual's budget line to shift up and to the right. This allows him/her to purchase more commodities such as "good health." Thus, it is hypothesized that income is associated positively with the probability of good mental health outcomes.

The variable $HealthBehaviorV_{ij}$ is a matrix of explanatory variables included to control for health-related factors that may be associated with an individual's health outcomes. It includes variables representing whether the respondent is covered by health insurance, a smoker, a moderate or heavy drinker, the respondent's level of BMI, and the respondent's level of physical activity. The variable, $Hcovered_{ij}$, is included to account for whether the respondent is covered by any form of health insurance. Medical care is said to be an input in the production function of the commodity "good health" (Grossman, 1972). Because access to medical care is an input in the production function of health capital, it is included in the analysis. It is hypothesized that having health insurance will be associated positively with good mental health outcomes, as the demand for health insurance is derived from the demand for the commodity "good health".

The explanatory variable, $Smoker_{ij}$, is included to examine the association between smoking and the respondent's reported health outcomes. The variable, $DrinkBehavior_{ij}$, is included to examine the association between different levels of alcohol consumption and the respondent's reported mental health outcomes. Smoking

and drinking are said to be market inputs into the gross investment function of the commodity "health." It is hypothesized that smoking is associated negatively with positive mental health outcomes because of its inherent risk to one's health. Additionally, it is hypothesized that drinking heavily will be associated negatively with good health outcomes due to its inherent medical risk to one's mental health.

The explanatory variable $PhysicalActivity(PA)_{ij}$ is included to control for and examine the associations of remaining active and physical health outcomes. According to the theory of health capital investment, physical activity is an investment in health capital and can help to improve one's stock of health. Therefore, it is hypothesized that PA_{ij} is associated positively with good physical health outcomes compared to those that do not report frequent physical activity. The variable $ObeseBMI_{ij}$ also is included to control for respondents' health behaviors associated with their overall health capital. It is hypothesized that those $ObeseBMI_{ij}$ is associated negatively with good physical health outcomes compared to those that do not fall within the obese category.

Lastly, DV_{ij} is a matrix of explanatory variables representing a respondent's demographic characteristics such as gender, race, education, and marital status. It has been shown in the research that health outcomes are better on average for married individuals compared to non-married individuals (Dave et al., 2008). Therefore, it is hypothesized that being $Married_{ij}$ is associated positively with good health outcomes compared to not married. According to Grossman (1972), changes in human capital, as measured by college education, can influence the marginal product of health capital investment which can shift the supply and demand of health capital. Thus, being

$CollegeEducated_{ij}$ is included in the analyses and is hypothesized to be associated positively with good health outcomes compared to not being college-educated. Table 2.5 lists the explanatory variables and their hypothesized sign on positive mental health outcomes.

Results

The marginal effects of retirement on the dependent variables $No\ Severe\ Depression_{ij}^{*}$, $No\ Depression_{ij}^{*}$, $No\ Mod/Sev\ Cog.Decline_{ij}^{*}$, $Above\ Avg.Mental\ Cognition_{ij}^{*}$, and $Excellent\ Mental\ Cognition_{ij}^{*}$ are presented in Table 2.6. The key result of this analysis is that retirement is associated negatively with each measure of mental cognition. Results indicate that retirement is associated with a 0.04 lower probability of not having moderate or severe cognitive decline, a 0.09 lower probability of having above avererage mental cognition, and a 0.05 lower probability of having excellent mental cognition. The far-right column of Table 2.6 is an analysis of possible endogeneity between retirement and mental health outcomes. It may be that the decision to retire is motivated by poor health, which may cause the relationship to be exaggerated. Thus, the analysis is restricted to respondents that indicate that health is not affecting or limiting their paid work. The results show that even after accounting for possible endogeneity, the decision to retire is associated negatively with both measures of mental cognition, although the magnitudes are less than when not controlling for it. As shown in Table 2.8, retirement is associated with a 0.04 lower probability of not having moderate or severe cognitive decline, a 0.08 lower probability of having above average mental cognition, and a 0.03 lower probability of having excellent mental cognitinon.

The marginal effects of the remaining explanatory variables on the mental health measures are presented in Tables 2.7. The marginal effects of the explanatory variables for the restricted sample accounting for engogeneity are presented in Table 2.8. The results indicate that income is associated positively with the probability of being in each of the good mental health outcomes. According to consumer demand theory, if income increases and the demand for a good increases, that good is considered a normal good. In this case, the evidence suggest that good mental health is a normal good. As shown at the top of Table 2.7, a one percent increase in income is associated with about a 0.01 to 0.03 higher probability of reporting good mental health oucomes, all else held constant. A one percent increase in income is associated with a 0.03 higher probability of having above average mental cognition. For the restricted sample in Table 2.8, income is associated with about a 0.02 higher probability of having above average mental cognition and a 0.01 higher probability of having excellent mental cognition.

Regarding health behaviors, being obese, having health insurance, smoking, drinking, and engaging in frequent physical activity are all significantly associated with not having severe depression. In this sample, being obese is associated with a 0.05 lower probability of not having any depressive symptoms, compared to those not obese. Looking at mental cognition, being obese is associated with a 0.01 higher probability of being in excellent mental cognition compared to those not being obese.

Having health insurance is shown to be associated positively with both measures of depression and two measure of mental cognition. Having health insurance is associated with a 0.02 higher probability of not having severe depression and a 0.04 higher

probability of not having any depressive symptoms, compared to not having insurance. Regarding mental cognition, having health insurance is associated with a 0.02 higher probability of not having moderate or severe cognitive decline, compared to not having health insurance. Additionally, health insurance is associated with a 0.05 higher probability of having above average mental cognition, compared to those that did not have health insurance. For the restricted sample, having health insurance is associated with a 0.03 higher probability of not having moderate or severe cognitive decline and a 0.04 higher probability of having above average mental cognition.

Interestingly, moderate and heavy drinking are associated positively across all mental health models for depression and mental cognition. Moderate drinkers have a 0.03 higher probability of not having severe depression and a 0.02 higher probability of not having any depressive symptoms, compared to non-drinkers. For mental cognition, moderate drinkers have a 0.02 higher probability of not having moderate or severe cognitive decline and a 0.02 higher probability of having above average mental cognition, compared to non-drinkers. Additionally, heavy drinkers have a 0.05 higher probability of not having severe depression and a 0.02 higher probability of not having any depressive symptoms, compared to non-drinkers. For the restricted sample, being a moderate drinker is associated with a 0.01 higher probability of not having severe depression and a 0.04 higher probability of not having any depressive symptoms compared to those that do not drink. Being a heavy drinker is associated with a 0.03 and 0.07 higher probability of not having moderate or severe cognititve decline and having above average mental cognition, respectively. As shown in table 2.7, smoking is associated negatively with not having

severe depressive symptoms and not having severe depression. In this sample, smokers have a 0.08 lower probability of not having sever depression, compared to non-smokers. It is likely that the drinking and smoking variable are highly correlated with a set of unobservable factors that influence the association in this unexpected manner.

As expected, the level of physical activity that respondents engage in is associated positively with each measure of mental health for the full sample. For the restricted sample, engaging in frequent physical activity is associated positively with each measure of depression. As shown in Table 2.7, respondents who engage in frequent physical activity have a higher probability of not having severe depression by 0.04 and a 0.01 higher probability of not having any depressive symptoms, compared to those who do not engage in frequent physical activity. Respondents who engage in frequent physical activity have a higher probability of not having moderate or severe depression and having above average mental cognition by 0.05 and 0.03, respectively, compared to those who do not engage in frequent physical activity. For the restricted sample, engaging in frequent physical activity is associated with a 0.01 higher probability of not having severe depression and 0.03 higher probability of not having any depressive symptoms.

Looking at the demographic variables in the bottom half of Table 2.7, being male is associated positively with not having severe depressive symptoms and associated positively with each measure of mental cognition compared to females. Being male is associated with a 0.04 higher probability of not having severe depressive symptoms in this sample. However, being male is associated with a 0.04 lower probability of not having moderate or severe cognitive decline, a 0.11 lower probability of having above

average mental cognition, and a 0.10 lower probability of having excellent mental cognition than females. For the restricted sample, being male is associated with a 0.04 higher probability of not having any depressive symptoms than females. For mental cognition, being male is associated with a 0.11 lower probability of having above average mental cognition.

Having a college education is associated with a 0.03 higher probability of not having severe depression, a 0.08 higher probability of not having any depressive symptoms, a 0.20 higher probability of above-average mental cognition, and a 0.11 higher probability of having excellent mental cognition, compared to those without a college education. For the restricted sample, having a college education is associated with a 0.02 higher probability of not having severe depression, a 0.07 higher probability of not having any depressive symptoms, compared to those without a college education. For mental cognition, a college education is associated with a 0.07, 0.21, and 0.11 higher probability of having no moderate or severe cognitive decline, above-average mental cognition, and excellent mental cognition, respectively.

Regarding race, blacks, Hispanics, and other races are associated negatively with each measure of mental health outcomes. Being black is associated with a 0.09 lower probability of not having any depressive symptoms, a 0.08 lower probability of no moderate or severe cognitive decline, a 0.15 lower probability of having above-average mental cognition, and a 0.06 lower probability of having excellent mental cognition, compared to whites. Being Hispanic is associated with a 0.06 lower probability of no moderate or severe cognitive decline, a 0.14 lower probability of having above-average

mental cognition, and a 0.07 lower probability of having excellent mental cognition, compared to non-Hispanics. People of other race are associated with a 0.12 lower probability of not having severe depression, a 0.06 lower probability of not having moderate or severe cognitive decline, compared to whites. For the restricted sample, people of other races are associated negatively with each mental health measure. From Table 2.8, people of other race are associated with a 0.02 lower probability of not having severe depression, a 0.17 lower probability of not having any depressive symptoms, a 0.08 lower probability of no moderate or severe cognitive decline, and a 0.14 lower probability of having above-average mental cognition, compared to whites. Being black is associated with a 0.13 lower probability of not having any depressive symptoms, a 0.09 lower probability of no moderate or severe cognitive decline, a 0.15 lower probability of having above-average mental cognition, and 0.09 lower probability of having excellent mental cognition, compared to whites. Lastly, being Hispanic is associated with a 0.08 lower probability of not having moderate or severe cognitive decline, a 0.14 lower probability of having above-average mental cognition, and a 0.06 lower probability of having excellent mental cognition, compared to non-Hispanics.

Conclusions

Analyzing seven waves of the Health and Retirement Study (HRS) that span from 2004 to 2018, this paper aims to discover how retirement influences an individual's investment motive for mental-health-capital, measured by no depressive symptoms and total mental cognition. This analysis confirms prior research, which suggests that retirement is negatively associated with positive mental health outcomes (Dave et al.,

2008). The results indicate that retirement does have a significant negative association with an individual's probability of good mental good mental cognition. Health is considered a normal good and having health insurance can influence positively mental health outcomes. As predicted, more educated respondents are more efficient producers of health capital.

The following chapter shifts the examination to a broader range of veterans from all ages to examine the various motives for, and the correlates of retirement-savings behavior. Additionally, the analysis examines the association between financial literacy, financial education, and positive retirement-savings behaviors.

Tables: Chapter III

Table 3.1: CESD Score Mean and Standard Error

Questions Asked:	Mean	Standard Error
1 – if Felt depressed, 0 – otherwise	0.0941	(0.0028)
1 – if Everything an effort, 0 – otherwise	0.1755	(0.0036)
1 – if Sleep was restless, 0 – otherwise	0.2568	(0.0041)
1 – if Did not feel happy, 0 – otherwise	0.1067	(0.0031)
1 – if Felt lonely, 0 – otherwise	0.1133	(0.0031)
1 – if Felt sad, 0 – otherwise	0.1232	(0.0032)
1 – if Could not get going, 0 – otherwise	0.1545	(0.0033)
1 – if Does not enjoy life, 0 – otherwise	0.0610	(0.0024)
N = 17,246		

Table 3.2: Depression Level Mean and Standard Error (CES-D Score Sum)

Questions Asked:	Mean	Standard Error
0 – No depressive symptoms	0.5325	(0.0036)
1 – Depressive symptom	0.2135	(0.0030)
2 –	0.0907	(0.0021)
3 –	0.0558	(0.0017)
4 –	0.0335	(0.0013)
5 –	0.0260	(0.0012)
6 –	0.0193	(0.0011)
7 –	0.0165	(0.0010)
8 – Depressive symptoms	0.0121	(0.0009)
N = 29,036		

Table 3.3: Dependent Variables for Depression and Mental Cognition

Variables	Mean	Standard Error
No Severe Depression (3 or less symptoms)	0.9164	(0.0021)
No Depressive Symptoms (0 symptoms)	0.5697	(0.0039)
No Moderate/Severe Cognitive Decline (>17 correct out of 35)	0.9186	(0.0026)
Above Average Mental Cognition (>22 correct out of 35)	0.6246	(0.0047)
Excellent Mental Cognition (>27 correct out of 35)	0.1447	(0.0034)
N = 17,246		

Table 3.4: Descriptive Statistics of Explanatory Variables

Independent Variables (Reference Category)	**Mean**	**(Standard Error)**
Retired	0.4952	(0.0030)
(Not Retired)		
Income	$48,358	($551.62)
Married	0.8257	(0.0026)
(Not Married)		
College Educated	0.2363	(0.0025)
(No College)		
Male	0.9812	(0.0008)
(Female)		
Race		
(White)		
Black	0.0727	(0.0012)
Hispanic	0.0289	(0.0008)
Other	0.0192	(0.0008)
BMI – Obese	0.2563	(0.0030)
(Not Obese)		
Health Insurance Coverage	0.6302	(0.0035)
(No Health Insurance)		
Smoker	0.1957	(0.0027)
(Non-Smoker)		
Drinking Behavior		
(Non-Drinker)		
Moderate drinker	0.2596	(0.0036)
Heavy drinker	0.1835	(0.0031)
Frequent Physical Activity	0.5468	(0.0063)
(No Frequent Physical Activity)		
N = 22,852		

Note: Data are for individuals ages 50 – 75 compiled from waves 7 – 14 of the RAND Health and Retirement Study (HRS) Longitudinal File 2018 (v1). Sample and stratification weights are used to adjust for the oversampling of African American and Hispanic respondents. Number of observations differ for each variable.

Table 3.5: Hypothesized sign of Explanatory Variables

Independent Variables	Positive Mental Health Outcomes
Retirement	(-)
LogIncome	+
Married	+
College Educated	+
Male	(-)
Blacks	(-)
Hispanics	(-)
Other Race	(-)
BMI - Obese	(-)
Health Insurance Coverage	+
Smokers	(-)
Moderate Drinkers	(-)
Heavy Drinkers	(-)
Frequent Physical Activity	+

Table 3.6: Marginal Effects of Retirement on Mental Health Outcomes

Dependent Variable Main Explanatory Variable	**Random Effects**	**Health Not Limiting**
No Severe Depression		
Retirement	**- 0.0064** (0.0061) **n = 4,064**	**0.0123** (0.0077) **n = 1,139**
No Depression		
Retirement	**- 0.0062** (0.0099) **n = 4,064**	**0.0259** (0.0178) **n = 1,139**
No Moderate/Severe Cognitive Decline		
Retirement	**- 0.0448***** (0.0069) **n = 3,751**	**- 0.0405***** (0.0106) **n = 1,106**
Above Average Mental Cognition		
Retirement	**- 0.0900***** (0.0126) **n= 3,751**	**- 0.0837***** (0.0224) **n = 1,106**
Excellent Mental Cognition		
Retirement	**- 0.0451***** (0.0084) **n= 3,751**	**- 0.0287*** (0.0166) **n = 1,106**

Note: Standard errors are in parenthesis
***p < 0.01, **p < 0.05, *p < .10

Table 3.7: Marginal Effects of Explanatory Variables on Mental Health Outcomes

Dependent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
	No Severe Depression	**No Depression**	**No Mod/Sev Cog Decline**	**Abv.Avg. Mental Cognition**	**Excellent Mental Cognition**
Explanatory Variables (Reference Category)	**M.E.** (s.e.)	**M.E.** (s.e.)	**M.E.** (s.e.)	**M.E.** (s.e.)	**M.E.** (s.e.)
LnIncome	**0.0116*** **	**0.0227*** **	**0.0173*** **	**0.0259*** **	**0.0132*** **
	(0.0022)	(0.0039)	(0.0030)	(0.0059)	(0.0042)
BMI - Obese	**- 0.0197*** **	**- 0.0476*** **	**0.0010**	**0.0114**	**0.0132***
(Not Obese)	(0.0066)	(0.0102)	(0.0024)	(0.0122)	(0.0077)
Health Insurance	**0.0200*** **	**0.0350*** **	**0.0236*** **	**0.0462*** **	**0.0077**
(No Health Insurance)	(0.0058)	(0.0093)	(0.0065)	(0.0110)	(0.0071)
Smoker	**- 0.0373*** **	**- 0.0762*** **	**- 0.0143**	**- 0.0234**	**- 0.0042**
(Non-Smoker)	(0.0087)	(0.0142)	(0.0092)	(0.0157)	(0.0102)
Moderate Drinker	**0.0263*** **	**0.0322*** **	**0.0183*** **	**0.0240** **	**0.0244*** **
(Non-Drinker)	(0.0060)	(0.0100)	(0.0070)	(0.0122)	(0.0087)
Heavy Drinker	**0.0184** **	**0.0486*** **	**0.0224*** **	**0.0623*** **	**0.0246** **
(Non-Drinker)	(0.0076)	(0.0134)	(0.0086)	(0.0152)	(0.0104)
Frequent Physical Activity	**0.0298*** **	**0.0441*** **	**0.0117*** **	**0.0516*** **	**0.0263*** **
(Not Frequent)	(0.0053)	(0.0079)	(0.0062)	(0.0099)	(0.0064)
Male	**0.0411** **	**0.0149**	**- 0.0397*** **	**- 0.1058*** **	**- 0.1007*** **
(Female)	(0.0177)	(0.0265)	(0.0137)	(0.0296)	(0.0238)
Married	**0.0692*** **	**0.0930*** **	**0.0213*** **	**0.0625*** **	**0.0113**
(Not Married)	(0.0081)	(0.0126)	(0.0082)	(0.0141)	(0.0084)
College Educated	**0.0265*** **	**0.0766*** **	**0.0680*** **	**0.1990*** **	**0.1090*** **
(No College Education)	(0.0077)	(0.0136)	(0.0070)	(0.0143)	(0.0105)
Blacks	**- 0.0121**	**- 0.0898*** **	**- 0.0778*** **	**- 0.1487*** **	**- 0.0596*** **
(Whites)	(0.0098)	(0.0166)	(0.0128)	(0.0180)	(0.0089)
Hispanics	**- 0.0624*** **	**- 0.0591** **	**- 0.0550** **	**- 0.1401*** **	**- 0.0650*** **
(Whites)	(0.0206)	(0.0292)	(0.0217)	(0.0314)	(0.0137)
Other Race	**- 0.0637*** **	**- 0.1186*** **	**- 0.0353**	**- 0.0552** **	**- 0.0133**
(Whites)	(0.0178)	(0.0240)	(0.0222)	(0.0295)	(0.0164)
Note: Standard errors are in parenthesis ***p < 0.01, **p < 0.05, *p < .10	**n= 4,064**	**n= 4,064**	**n= 3,751**	**n= 3,751**	**n= 3,751**

Table 3.8: Marginal Effects of Explanatory Variables on Mental Health Outcomes (Health Not a Limiting Factor)

Dependent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
	No Severe Depression	**No Depression**	**No Mod/Sev Cog Decline**	**Abv.Avg. Mental Cognition**	**Excellent Mental Cognition**
Explanatory Variables (Reference Category)	**M.E.** (s.e.)	**M.E.** (s.e.)	**M.E.** (s.e.)	**M.E.** (s.e.)	**M.E.** (s.e.)
LnIncome	**0.0008**	**0.0015**	**0.0098****	**0.0213****	**0.0175****
	(0.0032)	(0.0065)	(0.0057)	(0.0103)	(0.0077)
BMI - Obese	**0.0029**	**0.0410****	**- 0.0042**	**0.0065**	**0.0049**
(Not Obese)	(0.0075)	(0.0183)	(0.0117)	(0.0214)	(0.0142)
Health Insurance	**0.0060**	**0.0194**	**0.0334*****	**0.0360****	**- 0.0024**
(No Health Insurance)	(0.0067)	(0.0156)	(0.0100)	(0.0183)	(0.0126)
Smoker	**- 0.0008**	**- 0.0324**	**- 0.0007**	**- 0.0063**	**- 0.0029**
(Non-Smoker)	(0.0102)	(0.0281)	(0.0157)	(0.0302)	(0.0206)
Moderate Drinker	**0.0142****	**0.0365****	**0.0078**	**0.0319**	**0.0316****
(Non-Drinker)	(0.0070)	(0.0171)	(0.0106)	(0.0200)	(0.0151)
Heavy Drinker	**0.0069**	**0.0312**	**0.0313*****	**0.0656*****	**0.0500*****
(Non-Drinker)	(0.0081)	(0.0213)	(0.0115)	(0.0244)	(0.0186)
Frequent Physical Activity	**0.0119***	**0.0341****	**0.0097**	**0.0137**	**0.0204*****
(Not Frequent)	(0.0067)	(0.0137)	(0.0096)	(0.0064)	(0.0112)
Male	**0.0278**	**0.0426*****	**- 0.0092**	**- 0.1089****	**- 0.0612**
(Female)	(0.0236)	(0.0476)	(0.0275)	(0.0545)	(0.0396)
Married	**0.0477*****	**0.0990*****	**0.0134**	**0.1019*****	**0.0265**
(Not Married)	(0.0122)	(0.0241)	(0.0140)	(0.0266)	(0.0165)
College Educated	**0.0171****	**0.0731*****	**0.0661*****	**0.2099*****	**0.1117*****
(No College Education)	(0.0079)	(0.0215)	(0.0110)	(0.0228)	(0.0172)
Blacks	**0.0085**	**- 0.1317*****	**- 0.0890*****	**- 0.1548*****	**- 0.0863*****
(Whites)	(0.0107)	(0.0334)	(0.0251)	(0.0367)	(0.0153)
Hispanics	**- 0.0207**	**- 0.0599**	**- 0.0475***	**- 0.1855*****	**- 0.0583***
(Whites)	(0.0236)	(0.0516)	(0.0289)	(0.0513)	(0.0321)
Other Race	**- 0.0223*****	**- 0.1716*****	**- 0.0832****	**- 0.1352*****	**- 0.0060**
(Whites)	(0.0183)	(0.0393)	(0.0406)	(0.0551)	(0.0287)
Note: Standard errors are in parenthesis ***p < 0.01, **p < 0.05, *p < .10	**n= 1,139**	**n= 1,139**	**n= 1,106**	**n= 1,106**	**n= 1,106**

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CHAPTER IV
RETIREMENT-SAVING BEHAVIORS AND FINANCIAL LITERACY

Introduction

In 1974, Congress signed into law the Employee Retirement Income Securities Act (ERISA) which was intended to provide protections for individuals within established retirement and health care plans in the private industry. It makes information regarding plan features and funding available to plan participants and sets minimum standards for funding, vesting, participation, and benefit accrual. Later, Congress passed the Revenue Act of 1978 which included a provision in the Internal Revenue Code (IRC) known as Sec. 401(k) to allow employees to defer taxation on portions of income they elect to receive as deferred compensation (Employee Benefits Research Insititute, 2018). While the benefits of these legislative policies were intended to protect plan participants and provide alternative methods of tax-favored savings, one of the unintended consequences was that it now shifted the burden and risks of retirement savings from employers to employees (Gale, Papke & VanDerhei, 1999; Holland, Goodman & Stich, 2008; Munnell et al., 2011). Essentially, these policies made it more expensive for employers to offer and more difficult in terms of paperwork to comply with defined benefit (DB) plans compared to defined contribution (DC) plans, leading employers to drop DB plans in favor of DC plans (Rajnes, 2002).

According to data from the Employee Benefit Research Institute, the number of DP plans in 2018 was 46,869, while the total number of DC plans was 675,007. Additionally, between 2017 and 2018, DC-plan contributions increased by about 8% while DB-plan contributions fell by 38%, the most significant decrease recorded in the

historical dataset since 1975. The shift to DC plans may be problematic because an individual's retirement savings and overall retirement preparedness are now a direct result of their contributions, the employer's matching contributions, if any, and how well the plans' investments have performed. This contrasts with a DB plan that provides a guaranteed benefit, based on a formula that factors the individual's salary and time in service, regardless of market performance. As discussed in Munnell et al. (2011), DC-plan participants must now decide whether to participate in the plan, determine how much to contribute, allocate those contributions among investment options, reallocate over time, and determine how to withdraw the accumulated savings once retired.

Placing these responsibilities on individuals who may or may not have the financial sophistication to make well-informed decisions can profoundly impact overall retirement savings and wealth accumulation. As Lusardi and Mitchell (2007) discuss, planning successfully the optimal amount of retirement savings is inherently complex and demanding for each individual. Individuals planning for retirement must understand the concept of present discounted value, the difference between nominal and real amounts, and be able to project future labor income, pensions benefits, social security benefits, retirement ages, and survival probabilities, among many other factors. Given these difficulties, the authors find that those who are low educated, have low income, or are Black or Hispanic are at a higher risk of inadequately preparing for retirement.

According to the 2019 Survey of Consumer Finances, less than 40% of families in the bottom half of the income distribution have a retirement plan. Of those in the bottom half of the income distribution with a retirement plan, the average balance fell slightly to

$57,400. However, families in the upper-middle distribution and top 10 percent showed an increase to $170,600 and $692,800, respectively, in the average balance for participating retirement plans. While it is expected that families in the upper distributions of income may be able to save more, the low participation rate and exceptionally low average balances of the lower-income distribution families may be problematic for retirement success. According to a recent Gallup survey, the expectations of a comfortable retirement differ depending on income, with those in higher-income brackets reporting a more favorable outlook. The results indicate that 63% of those who make less than $40,000 do not expect to live a comfortable retirement, while only 25% of those who make $100,000 or more have the same expectation (Brenan, 2021).

While the data have shown that people are not planning, preparing, or saving enough for retirement, another problem policymakers have been acknowledging is the low level of financial education and the need for an increase in basic financial knowledge across the United States. In 2003, the Department of the Treasury established the Financial Literacy and Education Commission (FLEC) under the Fair and Accurate Credit Transactions Act to develop a national strategy for financial education. According to a recent study by Lin et al. (2019), 66% of Americans are unable to answer correctly more than three out of five questions on aspects of economics and finance that are encountered in everyday life. As discussed in Fox et al. (2005), the case for additional financial education is demonstrated by the alarming rates of bankruptcy, high consumer debt levels, low savings rates, and other adverse financial outcomes.

Concerned about the financial literacy and preparedness of military personnel, Congress enacted a law in 2016 requiring the Department of Defense (DoD) to provide comprehensive financial literacy training to all armed forces members. This was in response to widespread financial issues plaguing military service members at the time, affecting the overall readiness and morale of the troops. In one study consisting of 1,300 service members conducted by the FINRA Investor Education Foundation (2012), results indicate that, while military respondents fair better than national averages at making ends meet, planning ahead, and financial knowledge, they are more at risk concerning managing financial products such as their mortgages and other debts. They find that 91% of service members report having some form of debt and 49% with debt in the form credit cards are engaging in behaviors that impact negatively their financial situation. They are engaging in negative behaviors such as carrying a balance, making minimum payments, incurring late payments, exceeding lines of credit, or using the card for cash advances.

Given the facts above, this paper seeks to understand the associations between financial literacy, financial education, and positive retirement-savings behaviors among a community of active and prior service members. This analysis will examine three retirement-savings behaviors available from the National Financial Capability Study from 2012, 2015, and 2018.

Literature Review

Whether individuals should consume all or a portion of their current income in any given period has been studied rigorously throughout the economic literature on

consumption and savings. The difference between consumption and current income often is used as a measure of savings and brings about the examination of the motives individuals face regarding consumption and saving decisions. Several motives for saving a portion of income and resources for future consumption have been introduced over the years (Modigliani & Brumberg, 1954; Ando & Modigliani, 1963; Friedman, 1957; Hall, 1978; Carroll, 2001; Heckman & Hanna, 2015; Hubbard, Skinner, & Zeldes, 1994). These motives include preferences for future consumption, precautionary savings motives, bequest motives, a hedge against uncertainty, and behavioral factors among others.

Generally, consumption and savings decisions are made over the life cycle to smooth one's marginal utility of consumption. According to the Life-Cycle Income Hypothesis, individuals should expect variations in their income over time, as income is typically lower during younger ages, tends to rise with age, and eventually begins to decline (Modigliani & Brumberg, 1954). Given this expected income variation, the authors suggest that an individual's consumption and saving decisions consider current income, current resources, and expected future income. Individuals can engage in borrowing and lending activities from their current and future expected income to smooth variations in consumption over time. The extent to which an individual engages in borrowing and lending activities not only depends on the period of the life cycle and level of income but also on the individual's discount rate for future consumption (Modigliani & Brumberg, 1954; Friedman, 1957).

An individual's time preference often is measured by analyzing the slope of the indifference curves between consumption in two periods. Fisher (1930) suggests that one may equate the marginal rate of substitution for consumption between two time periods with the time preference of an individual. Accordingly, an individual with a high marginal rate of substitution for current consumption over future consumption is said to prefer current consumption and may tend more towards spending than saving. Alternatively, an individual with a low marginal rate of substitution for current consumption over future consumption is said to prefer future consumption to current consumption and may tend towards saving more now. As discussed in Becker and Mulligan (1997), the marginal rate of substitution varies significantly across individuals, even among those with relatively similar economic outlooks, and is an important factor in consumption and savings decisions.

While an individual's time preference for consumption is a major determinant of their savings another important factor to consider is the individual's preferences towards uncertainty. Kimball (1990) applies the Arrow-Pratt measure of risk aversion to the literature on consumption and saving to analyze the influence of income uncertainty on saving and consumption decisions. The author finds that the third derivative of the utility function with respect to total wealth is a good measure of the sensitivity towards uncertain future income. Depending on the sign of the third derivative, one can determine the presence of risk aversion. If the sign is positive, it is an indication of risk aversion and the uncertainty around future income introduces the precautionary savings motive which tends to reduce current consumption and increase current savings (Leland, 1978;

Kimball, 1990). Alternatively, if the sign is negative, the precautionary savings motive is not present and one may expect current consumption to increase and savings to decrease.

As the literature concerning consumption and saving decisions continues to grow, researchers are discovering additional significant factors that explain deviations in consumption and savings behavior. Building upon the Life-Cycle Theory of Modigliani and Brumberg, Shefrin and Thaler (1988) suggest that the inclusion of three behavioral financial factors can help enrich the consumption and savings literature by making it more behaviorally realistic. The authors propose the need to account for self-control, mental accounting, and framing when analyzing consumption and saving decisions over time. They argue that the marginal propensity to consume or save may depend on which mental account the individual places the funds they are consuming, whether it be from current income, current wealth, or future expected income. The marginal propensity to consume out of current income is the highest followed by current resources and future expected income. The decisions may also be affected by the willpower of the individual to exercise self-control and the cost of that will power which varies depending on the level of income and wealth accumulated (Shefrin & Thaler, 1988).

The research has shown that saving decisions are very complex and require lots of knowledge and understanding about one's personal financial standing now and in the future. These decisions also are significantly influenced by personal attributes, attitudes, and beliefs about the individual's ability to meet one's intended goals. The questions then arise: Are there any methods available to influence individuals' saving behaviors to prepare them for the future better? Is financial education an effective policy for targeting

individual financial behaviors? Lusardi (2004) examines data from the Health and Retirement Study to analyze whether financial education taught through retirement seminars influenced retirement savings. The author finds that financial education from the seminars is associated positively with multiple measures of wealth accumulation. Bernheim and Garrett (2003) use an annual household survey to analyze the association between broad measures of wealth accumulation and participation in an employer-sponsored financial education seminar. The authors find that virtually all measures of wealth accumulation are significantly higher for those who participated in the financial education seminar, especially among respondents in the 25th and 50th percentile ranges of income. Thus, financial education may play an important role in influencing retirement-savings behavior (Bell et al., 2009; Choi et al., 2011; Collins, 2013).

While the idea of providing basic financial education to improve the financial behaviors of consumers in the U.S. dates back to the 1950s (Bernheim et al. 2001), an increasing quantity of literature is beginning to examine the roll that financial literacy plays in influencing saving behaviors and wealth accumulation (Lusardi & Mitchell, 2007; Behrman et al., 2012; Jappelli & Padula, 2013; Hastings et al., 2013; Hastings & Mitchell, 2020). In one study, Lusardi and Mitchell (2007) analyze the Health and Retirement Study to examine the association between financial literacy and retirement saving patterns. The authors find that financial illiteracy is prevalent among respondents with low income, low education, and low wealth holdings. Additionally, they find that financial literacy is associated positively with wealth at the lower distribution of wealth. Their findings suggest that those with basic financial knowledge are better able to save.

In another study, Lusardi and Mitchell (2011) analyze the National Financial Capability Study to examine the association between financial literacy and retirement planning. Within this group of respondents, the authors find that financial illiteracy is most prevalent among the young, women, and the less educated. They also find that Hispanics and Blacks scored the least well on all of the financial literacy questions. Upon analysis, they find that respondents with higher financial literacy scores are significantly more likely to plan for retirement. The authors conclude that financial illiteracy leads to sub-optimal financial decisions that strain personal financial matters. They suggest that providing basic financial education and enhancing financial literacy is critical to a successful retirement among the most financially vulnerable.

This paper aims to extend the literature concerning retirement savings behavior into the veteran community to examine the associations between financial education, financial literacy, and three indicators of positive retirement-savings behavior. The goal is to analyze various motives for and characteristics of retirement savings and to examine the association between financial literacy, financial education, and positive retirement savings behaviors.

Data

This analysis uses the National Financial Capability Study (NFCS) that is commissioned by the FINRA Investor Education Foundation and conducted by ARC research. The study's overarching goal is to benchmark key indicators of financial capability for adults in the United States and evaluate how these indicators vary among demographic, behavioral, attitudinal, and financial literacy characteristics. Each State-by-

State survey consists of a nationally representative sample of over 25,000 American adults, which provides a comprehensive analysis of the nation's financial capability as a whole. Survey weights are included to allow the data to be representative of the national population in terms of age, gender, education, and Census Division.

In 2009, the survey was administered online to over 25,000 American adults and then readministered to another group of American adults every three years. This allows for a pooled-cross sectional analysis with randomly assigned respondents from 2012, 2015, and 2018. The first survey administered in 2009 did not provide questions regarding military service and thus cannot be pooled for the analysis on military respondents.

The total number of respondents after combining data from the three years collected was 80,164. Of the total respondents, 11,309 are current or former military members and will be the core sample of the analysis. Of the core sample, there are 1,613 active members of the military and 9,696 former members of the military. Additionally, 85% of the sample is male, 68% is white, 65% is married, and 62% has no college degree.

Dependent variable

The dependent variables used in this analysis are three measures of positive retirement-savings behavior. These behaviors include whether the respondents has a retirement plan with their employer, a retirement plan outside of their employer plan, or other investments outside of retirement accounts. A binary indicator variable is created and = 1 if the respondent has a retirement plan with their employer and = 0 otherwise.

Another indicator variable is created and = 1 if the respondent has a retirement plan outside of their employer and = 0 otherwise. Lastly, an indicator variable is created and = 1 if the respondent has other investments outside of a retirement account such as stocks, bonds, or mutual funds, and = 0 otherwise. Table 3.1 displays the weighted sample means for the dependent variables used in this analysis. As shown, 67% of the sample has an employer-sponsored plan, 47% has a retirement plan outside of their employer, and 48% has other investments outside of retirement accounts in a brokerage.

Explanatory variables

The primary independent variable in this analysis is the respondent's financial literacy score which ranges from 0 – 3. It is the sum of scores related to the "Big Three" financial literacy questions designed by Lusardi and Mitchell (2011) for the 2004 HRS to better understand core concepts regarding financial decisions such as interest rates, inflation, and risk diversification. In the NFCS, the respondents were asked three questions relating to inflation, interest rates, and the relationship between interest rates and bond prices. The first question is, "Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?" The answer choices are: more than $102, less than $102, exactly $102. The next question is, "Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?" The answer choices are: more than today, less than today, or exactly the same as today. The last question is, " If interest rates rise, what will typically happen to bond prices?" The answer choices are: they will

rise, they will fall, they will stay the same, or there is no relationship. A binary indicator variable is created for each of the questions and is = 1 if the respondent answers correctly or = 0 otherwise. The three questions are then summed into one variable measuring financial literacy ranging from no questions correct to answering all three questions correctly. From this score, an indicator variable is created for each number of correct answers and respondents who didn't answers any questions correctly will serve as the reference category.

Table 3.2 displays each of the financial literacy questions and the literacy score along with the weighted sample mean and standard error. As can be seen, the most difficult or most missed question is concerning the relationship between interest rates and bond prices, as only about 35% of the sample answered it correctly. The next most difficult question is regarding inflation with around 65% of respondents answering correctly. The question most correctly answered is the interest rate question with about 76% of the sample responding correctly. Lastly, the average financial-literacy score for this sample is around 1.76.

According to the literature, having received financial education may influence an individual's savings behaviors (Lusardi, 2004). Thus, another key explanatory variable is whether the respondent has received financial education. The respondents are asked if they have received financial education from a high school, a college, the military, or an employer. An indicator variable is created and = 1 if they received financial education from either one of the four options and = 0 if they did not receive any financial education from any source.

According to the theory of consumption and savings, individuals may be motivated to save for various reasons including a precautionary savings motive, to smooth consumption or even out income streams over the life cycle, to make bequests, and for other reasons related to individual's tastes and preferences. One of the key factors in the consumption function is the level of income to consume and save from (Modigliani & Brumberg, 1954). To account for income, an indicator variable is created for each of seven different levels of income including "Less than $15k", "$15k to $25k", "$25k to $35k", "$35k to $50k", "$50k to $75k", "$75k to $100k", and "$100k or more". Each variable is = 1 if the respondent is in that income category and = 0 otherwise. Those that make "Less than $15k" will serve as the reference category.

Additionally, the literature suggests that individuals who are averse to risky alternatives, especially regarding future unexpected income, may be more inclined to save rather than to spend (Kimball, 1990). Thus, to account for the respondent's aversion to risk, an indicator variable is created to measure whether the respondent is risk averse or risk willing. The NFCS ask respondents how willing they are to take risk on a scale of 1 to 10, from "not at all willing" to "very willing." The variable indicating risk aversion is = 1 if the respondent reports a 4 or less, and = 0 otherwise. The variable is broken up in this manner to better capture the different types of risk preferences individuals face, rather than looking at risk tolerance as if it were linearly determined. The cutoff point of point for 4 or less to indicate risk aversion is similar to a previous examination by Angrisani, Kapteyn, and Lusardi (2016).

The remaining independent variables included in the analysis are meant to capture individual tastes and preferences and include dummy variables for various categories for age, gender, ethnicity, marital status, and education. There are six categories for age, each of which is = 1 if the respondent is in that age group and = 0 otherwise. The age groups include those that are “18 to 24”, “25 to 34”, “35 to 44”, “45 to 54”, “55 to 64”, and “65 and older”. Respondents ages 18 to 24 will serve as the reference category for age. For gender, an indicator variable is created and = 1 if the respondent is male, and = 0 otherwise. For ethnicity, an indicator variable is = 1 if the respondent is non-white, and = 0 otherwise. The indicator variable for marital status is = 1 if the respondent is single, divorced, or widowed, and = 0 if the respondent is married. The variable is grouped in this manner due to the lack of variation in each of the categories for marital status. To account for education, an indicator variable is created and = 1 if the respondent has a two-year degree, a 4-year degree, or a graduate degree, and = 0 otherwise. This variable also is collapsed due to minimal variance in each category.

Descriptive Statistics

Table 3.3 and 3.4 display the weighted sample means and standard errors for each of the independent variables included in the analysis. One of the first things to note is that the sample is made up of about 85% males, which is representative of the general military population but not of the general population. For a closer look into the financial-literacy scores see Table 3.3, which reveals that 13% of the sample didn’t answer any questions correctly, 23% answered one correctly, 39% answered two correctly, and only 26% answered all three correctly. Additionally, only about 27% of the sample has received

some form of financial education. Furthermore, when examining respondents' attitudes towards risk, about 36% of this sample are risk averse.

For the remaining demographic and preference variables, it can be seen that 35% is not married, 32% is non-white, and 38% have a college degree. Regarding age categories, the largest category is those who are older than 65, followed by those between the ages of 55 and 64. The age group with least number of respondents is those who are between the ages of 18 and 24. For the income categories, the largest group is those who make between $50K to $75K a year, followed by those who make more than $100K a year, with about 21% of respondents in each category. The income categories with the least number of respondents are those who make between $15K to $25K a year and those who make $25K to $35K a year, with about 9% of respondents in each of these categories.

Model

The dependent variables $EmployerPlan_i$, $OtherPlan_i$, and $Brokerage_i$ are measured on a binary scale of 0 and 1, suggesting that a probit model is suitable for this analysis. This paper estimates a random-effects probit model via maximum likelihood as follows:

$$SavingsPlan_{ij}^{*} = \beta_0 + \beta_1 FinancialLiteracy_i + \beta_2 FinancialEducation_i$$

$$+\beta_3 RiskAversion_i + \beta_4 Children_i + \beta_5 Income_i + \beta_6 Age_{ij} + \beta_7 Male_i$$

$$+\beta_8 NotMarried_i + \beta_9 NonWhite_i + \beta_{10} Degree_i + e_i,$$

$$e_i \sim N(0,1)$$

where $SavingsPlan_{ij}^{*}$ is a latent variable representing the net unobserved benefit of saving for retirement. The error term, e_i, is assumed to follow a standard normal distribution centered around 0 and independent of the explanatory variables. The observability conditions are:

$$SavingsPlan_{ij} = \begin{cases} 1 \text{ if } SavingsPlan_{ij}^{*} > 0 \\ 0 \text{ if } SavingsPlan_{ij}^{*} \leq 0 \end{cases}$$

The observable outcomes for the retirement savings variables are represented by $EmployerPlan_i$, $OtherPlan_i$, and $Brokerage_i$. These observable outcomes are related to the latent unobservable measures $EmployerPlan_i^{*}$, $OtherPlan_i^{*}$, and $Brokerage_i^{*}$ through the observability conditions above. The subscript *i* represents the respondent, and the subscript *j* represents the particular dependent variable. The probit model results will examine the probability of a respondent a particular savings behavior given their conditions relating to the explanatory variables. Robust standard errors are calculated to account for heteroscedasticity, or non-constant variance, across respondents. Additionally, each regression contains a time dummy variable to capture the unobserved factors that may affect the respondent's savings behaviors between each of the years observed.

Table 3.5 lists the explanatory variables and their hypothesized effect on the dependent variable. According to the theory of human capital, an individual may invest in their stock of knowledge to make better-informed decisions (Becker, 1962). Thus, is hypothesized that financial literacy, financial education, and having a college degree will be associated positively with retirement-savings behavior. Additionally, because the age and income profiles of an individual are significant determinants of savings behavior, it is

hypothesized that income is expected to be associated positively with retirement-savings behavior. According to the life-cycle-income hypothesis, individual's save and borrow from future income during their younger years until they begin to decumulate in their later years, thus it is expected that age is associated negatively with retirement-savings behavior. According to the literature, there may exist gender and ethnic differences in savings behavior. Thus, it is hypothesized that being male is associated positively with retirement-savings behaviors and being non-white is associated negatively with retirement-savings behaviors. Lastly, it has been found that household composition is a major determinant of savings behavior. Therefore, it is hypothesized that being non-married is associated negatively with retirement-savings behavior.

Results

The marginal effects for financial literacy and financial education on the probability of having positive retirement-savings behavior are reported in Table 3.6. The marginal effects for the remaining independent variables are presented in Tables 3.7 and 3.8. From Table 3.6 it can be seen that answering all three financial literacy correct is associated positively with each measure of retirement-savings behavior. Answering three correctly is associated with about a 0.07 higher probability of having an employer provided plan compared to those that did not answer any correctly, all else constant. Additionally, answering all three correctly is associated with a 0.08 higher probability of having a retirement plan outside of their employer such as an IRA, and a 0.10 higher probability of having investments in a brokerage account when compared to those that did not answer any correctly. Answering one or two financial literacy questions correct

also is associated positively with various retirement-savings behaviors. Respondents who answered two correctly were associated with a 0.06 higher probability of having an employer-provided plan when compared to those who did not answer any correctly. Answering one correctly is associated with a 0.06 higher probability of having an employer provided retirement account and a 0.06 higher probability of having investments outside of retirement accounts in a brokerage, compared to those who did not answer any correctly.

Regarding financial education, those that have received financial education have a 0.03, 0.08, and a 0.09 increase in the probability of having an employer retirement account, a retirement account outside their employer, and a brokerage account, respectively. These marginal effects are compared to those that have not received any financial education.

Regarding the risk-aversion profile, it can be seen in Table 3.7 that being risk-averse is associated negatively with each measure of retirement savings, all else equal. Being risk-averse is associated with a 0.07 lower probability of having an employer provided retirement account and a 0.17 lower probability of having a retirement account outside of an employer, compared to those who are risk-willing. Additionally, being risk-averse is associated with a 0.24 lower probability of having investments outside of retirement accounts, compared to those who are risk-willing.

Table 3.7 shows the marginal effects of the proxy variables for preferences including gender, ethnicity, marital status, and education. Regarding employer-provided retirement plans, the only significant factor for preferences is marital status in this

sample. As shown, being not married is associated with a 0.07 lower probability of having an employer-provided retirement account, compared to those who are married. Looking at retirement accounts outside an employer-provided plan, the results indicate that ethnicity and education are associated significantly with having this type of account. As shown, being non-white is associated with a 0.04 lower probability of having a retirement account outside of an employer compared to those that are white. Having a college degree is associated with a 0.06 higher probability of having a retirement account outside of an employer, compared to those that do not have a college degree. Regarding brokerage accounts, being non-white is associated with a 0.04 lower probability of having investments outside of retirement accounts, compared to whites. Having a college degree is associated with a 0.06 higher probability of having a brokerage account, compared to those who do not have a college degree.

From Table 3.8, the results indicate that income is associated positively with each of the dependent variables, all else held constant. The results indicate also that the marginal effects of income become greater with higher levels of income compared to those in the lowest income category. Regarding ownership of an employer-provided plan, the results indicate that making between $15K and $25K is associated with a 0.15 higher probability of having this type of account, compared to those that make less than $15K. Looking at the highest level of income, making more than $100K is associated with a 0.65 higher probability of having an employer-provided plan, compared to those who make less than $15K. Concerning retirement accounts outside of an employer, making between $25K and $35K is associated with a 0.08 higher probability of having this

account, compared to those that make less than $15K. For the highest level of income, making more than $100K is associated with a 0.40 higher probability of having a retirement account outside of an employer, when compared to those that make less than $15K. For brokerage accounts, making between $25K and $35K is associated with a 0.10 higher probability of having investments outside of retirement accounts, compared to those that make less than $15K. For the highest level of income, making more than $100K is associated with a 0.40 higher probability of having a brokerage account, compared to those that make less than $15K.

Examining the age categories in Table 3.8, the results indicate that age is associated negatively with each of the retirement-saving behaviors, all else held constant. As shown, being 55 to 64 years of age is associated with a 0.06 lower probability of having an employer-sponsored plan, compared to those that are 18 to 24 years old. Additionally, being 65 years of age or older is associated with a 0.08 lower probability of having an employer-sponsored plan, compared to those that are between the ages of 18 to 24. Regarding retirement accounts outside of an employer, being 35 to 44 years of age is associated with a 0.16 lower probability of having this type of account, compared to those between the ages of 18 and 24. Additionally, being 45 to 54 is associated with a 0.20 lower probability of ownership while being 55 to 64 is associated with a 0.13 lower probability of having retirement accounts outside of an employer, both compared to those between the ages of 18 to 24. Lastly, regarding brokerage accounts, being 35 to 44 years of age is associated with a 0.12 lower probability of having this type of account, compared to those between the ages 18 to 24. Furthermore, being 45 to 54 is associated

with a 0.16 lower probability of having a brokerage account, while being 55 to 64 is associated with a 0.11 lower probability of having, both compared to those between the ages of 18 and 24.

Each regression also included a time dummy variable to account for the differences in retirement-savings behavior between the years of observations. As indicated, there are significant differences for having an employer provided plan, having a retirement plan outside of an employer-sponsored plan, and for having a brokerage account. As shown, there is a 0.02 higher probability of having an employer sponsored plan for respondents in 2018 compared respondents in 2012. For retirement accounts outside of an employer, it can be seen that respondents for 2015 have a 0.03 higher probability of having this type of account and respondents for 2018 have a 0.08 higher probability of having this type of account, compared to respondents in 2012. For brokerage accounts, respondents in 2015 have a 0.06 lower probability of having this type of account, compared to respondents from 2012.

Conclusions

Anaylzing three cross-sectional surveys from the National Financial Capability Study administered in the years 2012, 2015, and 2018, this analysis aims to discover what factors are associated with positive retirement-savings behaviors among current and prior service members. This analysis examines also the relationship between financial education, financial literacy, and positive retirement-savings behaviors. The results indicate that financial education and higher levels of financial literacy are associated positively with each measure of retirement-savings behaviors. In conclusion, policies or

initiatives that encourage and implement financial education and promote financial literacy may help to influence the retirement-savings behavior of current and former members of the military.

Tables: Chapter IV

Table 4.1 – Weighted Mean of Retirement Savings Behavior

Savings Behavior	Mean	Standard Error
Employer Plan	0.6655	(0.0053)
Plan Outside Employer	0.4686	(0.0056)
Brokerage accounts	0.4784	(0.0056)
N = 10,901		

Table 4.2 – Weighted Mean of Financial Literacy Questions

Question	Mean	Standard Error
Interest Rates	0.7605	(0.0049)
Inflation	0.6517	(0.0054)
Interest Rates/ Bond Prices	0.3465	(0.0052)
Financial Literacy Score	1.7587	(0.0109)
N = 11,309		

Table 4.3 – Weighted Mean of Financial Literacy Score

Correctly Answered	Mean	Standard Error
None Correct	0.1299	(0.0039)
One Correct	0.2320	(0.0048)
Two Correct	0.3875	(0.0053)
Three Correct	0.2505	(0.0047)
N = 11,309		

Table 4.4: Descriptive Statistics of Explanatory Variables

Independent Variables (Reference Category)	**Mean**	**(Standard Error)**
Financial Education (No Financial Education)	0.2677	(0.0049)
Risk Averse (Risk Willing)	0.3518	(0.0053)
Income (Less than $15K)		
$15K – $25K	0.0925	(0.0033)
$25K – $35K	0.0953	(0.0033)
$35K – $50K	0.1449	(0.0039)
$**50K – $75K**	0.2164	(0.0045)
$75K – $100K	0.1736	(0.0042)
More than $100K	0.2092	(0.0044)
Age Categories (18 – 24)		
25 – 34	0.1542	(0.0043)
35 – 44	0.1221	(0.0036)
45 – 54	0.1628	(0.0041)
55 – 64	0.1831	(0.0042)
65 or Older	0.3201	(0.0050)
Male (Female)	0.8523	(0.0038)
Non-White (White)	0.3223	(0.0055)
Not Married (Married)	0.3514	(0.0053)
College Degree (No Degree)	0.3801	(0.0052)
n = 11,303		

Note: National level weights are applied to be representative of the national population in terms of age, gender, education, and Census Division.

Table 4.5: Hypothesized Sign of Explanatory Variables

Independent Variables (Reference Category)	**Hypothesized sign**
Financial Literacy	+
Financial Education (No Financial Education)	+
Risk Averse (Risk Willing)	(-)
Income (Less than 15K)	
15K – 24K	+
25K – 34K	+
35K – 50K	+
50K – 75K	+
75K – 100K	+
More than 100K	+
Age Categories (18 – 24)	
25 – 34	+
35 – 44	+
45 – 54	+
55 – 64	(-)
65 or Older	(-)
Male (Female)	+
Non-White (White)	(-)
Not Married (Married)	(-)
College Degree (No Degree)	+

Table 4.6: Marginal Effect of Financial Literacy and Financial Education on Retirement-Savings Behavior

	Dependent Variables		
Independent Variables (Reference Category)	**Employer Plan**	**Other Ret. Plan**	**Brokerage Account**
	M.E. (s.e.)	**M.E.** (s.e.)	**M.E.** (s.e.)
Financial Literacy (None Correct)			
One Correct	**0.0613***** (0.0170)	**0.0091** (0.0195)	**0.0646***** (0.0191)
Two Correct	**0.0625***** (0.0167)	**- 0.0360*** (0.0188)	**- 0.0076** (0.0186)
Three Correct	**0.0667***** (0.0181)	**0.0819***** (0.0205)	**0.0983***** (0.0203)
Financial Education (No Financial Education)	**0.0335***** (0.0110)	**0.0839***** (0.0119)	**0.0889***** (0.0119)
	n = 10,731	n = 10,665	n = 10,670

Note: National level weights are applied to be representative of the national population in terms of age, gender, education, and Census Division. Standard errors are in parenthesis.
***p < 0.01, **p < 0.05, *p < .10

Table 4.7: Marginal Effects of Remaining Explanatory Variables on Retirement-Savings Behaviors

	Dependent Variables		
	Employer Plan	**Other Ret Plan**	**Brokerage Account**
Independent Variables (Reference Category)	**M.E.** (s.e.)	**M.E.** (s.e.)	**M.E.** (s.e.)
Risk Averse (Risk Willing)	**- 0.0743*** ** (0.0107)	**- 0.1743*** ** (0.0117)	**- 0.2388*** ** (0.0117)
Male (Female)	**- 0.0154** (0.0133)	**- 0.0188** (0.0149)	**- 0.0018** (0.0146)
Non-White (White)	**0.0017** (0.0114)	**- 0.0366*** ** (0.0124)	**- 0.0355*** ** (0.0123)
Not Married (Married)	**- 0.0655*** ** (0.0114)	**- 0.0151** (0.0122)	**0.0124** (0.0121)
College Degree (No Degree)	**- 0.0129** (0.0100)	**0.0582*** ** (0.0110)	**0.0578*** ** (0.0109)
Year (2012)			
2015	**0.0111** (0.0117)	**0.0318** ** (0.0127)	**- 0.0588*** ** (0.0126)
2018	**0.0238** ** (0.0119)	**0.0842*** ** (0.0129)	**- 0.0198** (0.0128)
	n = 10,731	n = 10,665	n = 10,670

Note: National level weights are applied to be representative of the national population in terms of age, gender, education, and Census Division. Standard errors are in parenthesis. ***p < 0.01, **p < 0.05, *p < .10

Table 4.8: Marginal Effects of Remaining Explanatory Variables on Retirement-Savings Behaviors

	Dependent Variables		
	Employer Plan	**Other Ret Plan**	**Brokerage Account**
Independent Variables (Reference Category)	**M.E.** (s.e.)	**M.E.** (s.e.)	**M.E.** (s.e.)
Income Categories (Less than 15K)			
15K – 25K	**0.1524*** ** (0.0270)	**0.0389** (0.0278)	**0.0154** (0.0285)
25K – 35K	**0.2905*** ** (0.0272)	**0.0799*** ** (0.0275)	**0.0996*** ** (0.0286)
35K – 50K	**0.3960*** ** (0.0248)	**0.1330*** ** (0.0260)	**0.1540*** ** (0.0270)
50K – 75K	**0.5133*** ** (0.0235)	**0.2354*** ** (0.0252)	**0.2450*** ** (0.0262)
75K – 100K	**0.6407*** ** (0.0235)	**0.3618*** ** (0.0263)	**0.3658*** ** (0.0269)
More than 100K	**0.6555*** ** (0.0232)	**0.4036*** ** (0.0263)	**0.3967*** ** (0.0271)
Age Categories (18 – 24)			
25 – 34	**0.0209** (0.0248)	**- 0.0302** (0.0305)	**0.0089** (0.0291)
35 – 44	**- 0.0264** (0.0254)	**- 0.1635*** ** (0.0305)	**- 0.1184*** ** (0.0296)
45 – 54	**- 0.0355** (0.0248)	**- 0.2033*** ** (0.0302)	**- 0.1554*** ** (0.0292)
55 – 64	**- 0.0573** ** (0.0249)	**- 0.1282*** ** (0.0300)	**- 0.1105** ** (0.0289)
65 or Older	**- 0.0783*** ** (0.0246)	**0.0040** (0.0296)	**0.0173** (0.0286)
	n = 10,731	n = 10,665	n = 10,670

Note: National level weights are applied to be representative of the national population in terms of age, gender, education, and Census Division. Standard errors are in parenthesis. ***p < 0.01, **p < 0.05, *p < .10

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