

# The Psychology of Portfolio Withdrawal Rates

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This study investigates how personality and psychological characteristics shape portfolio withdrawal rates (PWR) within a sample of 3,678 U.S. individuals age 50 and over from the Health and Retirement Study. Structural equation model results revealed that those with greater conscientiousness, extraversion, positive affect, and financial self-efficacy have lower PWR; whereas those with greater openness, agreeableness, neuroticism, and negative affect have higher PWR. Findings from this study break new ground by establishing a link between psychological characteristics and PWR. Moreover, results provide insight to financial planning practitioners as they explore retirement income planning beyond its technical aspects and seek to maximize their clients' satisfaction from the consumption of their retirement portfolios.

**Keywords:** portfolio withdrawal rates, retirement, personality, psychological characteristics

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Little is known about what motivates the portfolio withdrawal decisions of retirees, as most studies on portfolio withdrawal rates address technical and economic issues related to retirement income planning. Within this literature, portfolio withdrawal rates (PWR) have been defined as the rate at which people withdraw money from their investments and other retirement savings accounts. For example, previous models have focused on economic issues such as optimizing portfolio spending in light of risk factors and satisfaction (MacDonald, Jones, Morrison, Brown, & Hardy, 2013), minimizing the risk of a financial shortfall (MacDonald et al., 2013), and making spending adjustments based on perceived remaining life expectancy (Milevsky & Huang, 2011). These models, along with studies that address safe portfolio withdrawal rates, portfolio income-producing products, and retiree spending profiles, help create a better understanding of the market factors that must be considered when developing retirement income plans but do little to inform the human side of the decision-making process. With a wealth of knowledge related to technical planning strategies and economic issues, the literature lacks evidence on how person-level behavioral characteristics affect the portfolio with-

drawal decisions of retirees. Therefore, the purpose of this study is to investigate the relationship between personal characteristics and portfolio withdrawal rates to deepen our understanding of the behavioral mechanisms that may explain postretirement spending decisions. This study makes a contribution to the literature by using psychological theory to examine portfolio withdrawal rates, thereby addressing and raising awareness of the human dimension that must be considered when developing retirement income plans.

Portfolio withdrawal rates (PWR) are an important metric when considering postretirement consumption because they quantify the magnitude of portfolio withdrawals relative to available financial assets. Portfolio withdrawal rates are typically viewed through the life cycle hypothesis—an economic theory that predicts households' plans for consumption over the life-course by accumulating financial assets during the working years and spending them down at a constant rate in retirement to fund their consumption goals (Ando & Modigliani, 1963). Doing this successfully would lead to a smoothing in utility from consumption across time and the maximization of overall lifetime utility. Following the life cycle hypothesis, a general assumption in the portfolio withdrawal literature is that retirees spend a constant amount of money each year based on a percentage of accumulated investment assets (Bengen, 1994; Cooley, Hubbard, & Walz, 1998; Guyton, 2004; Pfau, 2012). However, rather than spending down accumulated retirement savings, researchers have found that retirees' portfolio values either held steady or increased over time (Browning, Guo, Cheng, & Finke, 2016; Haider, Hurd, Reardon, & Williamson, 2000; Love, Palumbo, & Smith, 2009; Poterba, Venti, & Wise, 2011a, 2011b; Smith, Soto, & Penner, 2009). This observation is at odds with the life cycle hypothesis and has been found to persist even under the required minimum distribution rules associated with defined contribution and IRA accounts (Poterba et al., 2011b). This research provides evidence of a retirement consumption puzzle where retirees aren't spending down retirement wealth as expected according to theory (Haider & Stephens, 2007).

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While some individuals exhibit precautionary saving and less portfolio consumption than expected, research has shown a tendency for others to exhibit more. Factors that have been associated with an increased likelihood of depleting assets are having little to no preretirement accumulation activity, health care expenses (both prolonged and unexpected), lifespans that were notably longer than expected, and changes in family composition, (e.g., death of spouse or divorce; Poterba, Venti, & Wise, 2015). Overall, there are a number of factors that could explain the withdrawal rates of retirees. Retirement wealth has been found to be negatively related to PWR (Poterba et al., 2011a, 2015). Smith et al. (2009) also found a negative relationship between income and PWR. Factors that have been positively associated with PWR are maleness (MacDonald et al., 2013), longevity expectations (Browning, 2018; Poterba et al., 2015), health care expenses (both prolonged and unexpected), and changes in family composition (e.g., death of spouse or divorce; Poterba et al., 2015). Browning, Huston, and Finke (2016) found that retirees' levels of cognitive ability were positively related to portfolio withdrawal rates and that retirees with higher levels of cognitive ability were better equipped to incorporate factors of uncertainty into retirement spending decisions. Davies (1981) and De Nardi, French, and Jones (2009) argued that uncertain life expectancies were sufficient to explain postretirement spending. Others have posed bequest motives as a possible explanation for PWR with mixed results (De Nardi, French, & Jones, 2010; Dynan, Skinner, & Zeldes, 2002; Hurd, 1987, 1989, 2002). Browning et al. (2016) found that bequests and uncertainties related to longevity and medical expenses provided a partial explanation for postretirement withdrawal rates but did not completely explain spending behavior. Their results pointed to the potential role of behavioral explanations for postretirement consumption patterns and called for a more in-depth consideration of the psychological factors that influenced retirees' portfolio withdrawal decisions. Consequently, we turned to a psychological framework, the 3M Model of Motivation and Personality, to investigate portfolio withdrawal rates and to lay a foundation for future research focused on the psychological mechanisms associated with portfolio withdrawal rate behavior.

### The 3M Model of Motivation and Personality

The 3M Model of Motivation and Personality is a model that explains how personality traits combine with other psychological characteristics to influence consumer behavior (Mowen, 2000). The 3M model describes how surface traits, defined as tendencies to behave within a particular behavioral domain, are explained by three layers of traits and characteristics: elemental, compound, and situational. Portfolio withdrawals are a consumer behavior related to spending decisions in retirement that can be observed and measured; thus, portfolio withdrawal behavior is considered a surface trait. The literature suggests personality traits (i.e., the Big Five) are a robust predictor of financial behavior, and therefore, the 3M Model of Motivation and Personality might offer a useful framework for explaining the psychological origins of portfolio withdrawal rates.

### Elemental Traits

The *Big Five* personality traits are considered elemental traits that have been shown to affect consumer behavior (Mowen, 2000):

openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (Costa & McCrae, 1992). Openness has been linked to positive long-term saving and investing intentions (Mayfield, Perdue, & Wooten, 2008). Also, individuals high in openness exhibit less materialism; however, they tend to demonstrate imprudent money management tendencies (Troisi, Christopher, & Marek, 2006). Thus, greater openness may be associated with higher portfolio withdrawal rates if the imprudent financial management behavior persists into the portfolio withdrawal stage.

The conscientiousness trait has been found to support retirement planning behavior (Hershey & Mowen, 2000), is associated with more stable risk preferences (Soane & Chmiel, 2005), and has been linked to greater net worth levels (Nabeshima & Seay, 2015). Less conscientious individuals have demonstrated compulsive buying behavior (Mowen & Spears, 1999) and may be less likely to plan. Overall, conscientiousness has been associated with prudent and successful financial behavior, potentially resulting in lower portfolio withdrawal rates if this saving-oriented behavior is continued and applied to financial decisions during the portfolio withdrawal stage.

Individuals with high extraversion have greater net worth levels (Nabeshima & Seay, 2015), and may have an increased ability to adjust to retirement (van Solinge & Henkens, 2005). This financial and adjustment success may be due to the strong presence of positive emotions associated with the extraversion trait, as positive emotions have been shown to precede controlled and future-oriented financial behavior (Güven, 2012). As a result, those with greater levels of extraversion may have a larger retirement portfolio that supports a controlled spending plan, thereby exhibiting lower portfolio withdrawal rates.

Higher levels of agreeableness are associated with less wealth (Nabeshima & Seay, 2015), a lower propensity to invest in risky assets (Jadlow & Mowen, 2010), and increased compulsive buying behavior (Mowen & Spears, 1999). Agreeableness has also been linked to increased bequest motives (Sikkel & Schoenmakers, 2012). Overall, individuals with higher agreeableness may be more financially generous to others, even if it puts their own financial goals at risk. Consequently, those scoring higher in agreeableness may be more willing to spend their financial wealth at a greater rate than those who score lower on this trait.

Individuals high in neuroticism tend to exhibit high and enduring levels of worry, stress, and fear; they also demonstrate less ability to adjust to life circumstances. Individuals who score low on the neuroticism trait are calm and relaxed, even when facing stressful situations. Individuals with greater emotional stability have been shown to exhibit more prudent and controlled financial behavior: Mowen and Spears (1999) found a negative relationship between emotional stability and compulsive consumption. Negative emotions, a hallmark of the neuroticism trait, have been shown to adversely affect financial decision making. For example, Neukam and Hershey (2003) found that fear and worry undermined saving goals and planning among preretirees; Durand, Newby, and Sanghani (2008) found that negative emotions contributed to investment decisions that were detrimental to portfolio performance. If similar financial habits persist in the portfolio withdrawal phase, then those with greater levels of negative affect and more neurotic tendencies may spend more and make poorer investment decisions that hinder their portfolio performance, resulting in a lower port-

folio balance and a higher portfolio withdrawal rate than individuals with lower levels of the neuroticism trait.

### Compound Traits

Positive and negative affect are associated with consumer saving and spending decisions and meet the compound trait criteria under the 3M Model of Motivation and Personality. Consequently, these traits were investigated as compound traits within this study. Positive emotions have been shown to boost earning ability, work success, self-control, and self-efficacy (Bandura, 1997; Lyubomirsky, King, & Diener, 2005). Guven (2012) found that happiness led to better saving behavior, a future orientation, more control, less debt, and greater optimism. These results suggest positive affect facilitates prudent financial behavior and success. If similar saving-oriented financial habits persist in the portfolio withdrawal phase, those with greater levels of positive affect may consume their portfolio at a slower rate than those with lower levels of positive affect. As outlined under the neuroticism trait above, negative emotions have been shown to exhibit an adverse relationship with financial decision making, including portfolio management decisions, which may result in higher portfolio withdrawals than those with more emotional stability.

### Situational Traits

Mowen (2000) proposed that domain-specific self-efficacy falls within the situational trait category and is important to consumer behavior. Self-efficacy is defined as “. . . people’s beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives” (Bandura, 1991, p. 257). Bandura stated that self-efficacy is highly influential in the self-regulatory process and is a domain-specific trait. Thus, financial self-efficacy may serve a role in shaping portfolio withdrawal decisions. Financial self-efficacy has been linked to positive financial behaviors and financial outcomes including saving, reduced debt, and financial satisfaction (Asebedo & Payne, 2019; Farrell, Fry, & Risse, 2016; Lown, 2011). Consequently, those with greater financial self-efficacy may feel more satisfied and in control over their financial situation—characteristics typically associated with saving and sound financial management practices. If these affective, control, and saving tendencies continue in the portfolio withdrawal phase, then those with greater financial self-efficacy might exhibit similar wealth accumulation behavioral patterns when making portfolio withdrawal decisions, resulting in lower PWR than those with weaker financial self-efficacy.

## Hypotheses

### Direct Effects

Informed by the 3M Model of Motivation and Personality and existing literature, the direct effects associated with portfolio withdrawal rates were investigated through eight hypotheses:

#### Elemental traits

*H1:* Openness to experience is associated with higher portfolio withdrawal rates.

*H2:* Conscientiousness is associated with lower portfolio withdrawal rates.

*H3:* Extraversion is associated with lower portfolio withdrawal rates.

*H4:* Agreeableness is associated with higher portfolio withdrawal rates.

*H5:* Neuroticism is associated with higher portfolio withdrawal rates.

#### Compound traits:

*H6:* Positive affect is associated with lower portfolio withdrawal rates.

*H7:* Negative affect is associated with higher portfolio withdrawal rates.

#### Situational traits:

*H8:* Financial self-efficacy is associated with lower portfolio withdrawal rates.

### Indirect Effects

Based upon the 3M Model of Motivation and Personality and existing literature, two additional hypotheses for indirect effects were investigated:

*H9:* Compound traits (i.e., positive and negative affect) are indirectly connected to portfolio withdrawal rates through situational traits (i.e., financial self-efficacy).

*H10:* Elemental traits (i.e., the Big Five) are indirectly connected to portfolio withdrawal rates through combinations of situational (i.e., financial self-efficacy) and compound traits (i.e., positive and negative affect).

## Method

### Data and Sample

Data were utilized from the 2012 and 2014 waves of the Health and Retirement Study, a nationally representative data set sponsored by the National Institute on Aging (grant number NIA U01AG009740) and conducted by the University of Michigan. The 2014 RAND data file (RAND HRS Data, 2016) was paired with personality and psychological data from the 2012 and 2014 waves of the Leave-Behind Psychosocial and Lifestyle Questionnaire (Health and Retirement Study, 2016), which collects information from half of the Health and Retirement Study sample on a rotating basis at each biennial collection cycle. The RAND data file is a user-friendly longitudinal data set based on the Health and Retirement Study data and was developed at RAND with funding from the National Institute on Aging and the Social Security Administration. Moreover, IRA withdrawals for the respondent and spouse were incorporated from the RAND Tax Calculations, 2000–2014 (v1) Health and Retirement Study data file (RAND HRS Data, 2017); this data file contains information about federal, state, and FICA taxes for respondents to the 2000–2014 Health

and Retirement Study surveys. They were developed at RAND with funding from the National Institute on Aging and the Social Security Administration. The analytic sample was restricted to the financial respondent for households with portfolio withdrawals and financial assets greater than \$0. Respondents who were unemployed, disabled, and not in the labor force for unknown reasons were excluded from the model to reduce model ambiguity for unique or unknown circumstances. The final analytic sample included 3,678 observations.

## Variables

### Outcome variable: Portfolio withdrawal rate (surface trait).

Portfolio withdrawal rate (PWR) levels in 2014 were the outcome of interest and were computed as portfolio distributions divided by financial assets. Given limitations in the data set utilized for this study, it was not possible to determine the proportion of portfolio distributions spent versus deposited to other accounts and accumulated for future use. For example, an IRA withdrawal from a required minimum distribution can be deposited to a short-term savings account and may not actually be spent until a future time period. Therefore, given the dataset limitations, all dollars withdrawn from the portfolio within the survey year are assumed to be included in the portfolio withdrawal rate. This is a limitation to this study, as noted in the limitations section. Furthermore, the Health and Retirement Study does not have a specific PWR variable, therefore PWR was estimated through a combination of variables. The estimation method for portfolio distributions (the numerator) and financial assets (the denominator) is defined in further detail below.

Portfolio distributions were defined as total household income plus IRA withdrawals minus other noninvestment portfolio income sources. Only those with portfolio distributions greater than zero were included in the analysis. Total household income is the sum of all income in a household (e.g., earnings, capital, pension, annuities, Social Security, unemployment, government transfers, and other lump sum sources), but does not include IRA withdrawals; thus, IRA withdrawals were added to total household income. Noninvestment portfolio income sources were removed from total household income to isolate portfolio distributions. Noninvestment portfolio income sources included earnings (from work), annuities, Social Security disability and retirement benefits, worker's compensation, other government transfers, business income (capital), rental income (capital), self-employment income (capital), and lump sum distributions from insurance, pension, or inheritance. As defined by the Health and Retirement Study, "pension" income encompasses both defined contribution and defined benefit employer-sponsored retirement plans. Thus, ongoing and regular "pension" income sources were included as a portfolio distribution so that defined contribution plans (e.g., 401k, 403b, etc.) were accounted for.

Financial assets were defined as the sum of total household financial assets, including stocks, bonds, checking, savings, CDs, government savings bonds, T-bills, IRAs, and current defined contribution retirement plans. Respondents without any financial assets were excluded from the model. Portfolio withdrawal rates were transformed through a natural logarithmic function.

**Financial self-efficacy (situational trait).** Financial self-efficacy was derived from the Leave-Behind Psychosocial data.

On an 11-point scale ranging from 0 (*no control at all*) to 10 (*very much control*), respondents rated the amount of control they had over their current financial situation. This measurement of financial self-efficacy aligns with existing research (McAvay, Seeman, & Rodin, 1996) and is consistent with Bandura's (1991) description of self-efficacy: "... people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (p. 257).

**Positive and negative affect (compound traits).** Two latent variables estimating positive and negative affect were utilized to measure respondents' proclivity to experience positive and negative emotional states. Indicators were constructed in accordance with recommended methodology based upon a series of emotions from the *Positive and Negative Affect Schedule—Expanded Form* (PANAS-X). Respondents reported on a five-point Likert-type scale the extent to which they felt various emotions within the past 30 days. Positive affect was estimated by 12 indicators: *determined, enthusiastic, active, attentive, excited, inspired, hopeful, alert, happy, content, proud, and interested*. Negative affect was estimated by 12 indicators: *afraid, scared, upset, frustrated, guilty, ashamed, bored, hostile, jittery, nervous, sad, and distressed*. The positive affect construct demonstrated excellent internal reliability with a Cronbach's Alpha score of .93; the negative affect construct demonstrated good internal reliability with a Cronbach's Alpha score of .89.

**Big five personality traits (elemental traits).** Elemental traits were operationalized through the Big Five personality traits: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Each trait was measured as a latent variable with indicators obtained from the Leave-Behind Psychosocial survey. Indicators were measured in accordance with recommended methodology on a 4-point Likert-type scale based upon the extent to which respondents felt various adjectives described them; higher scores reflected greater identification with each Big Five trait. Openness to experience was measured by seven adjectives: *creative, imaginative, intelligent, adventurous, sophisticated, curious, and broad-minded*. Conscientiousness was measured by seven adjectives: *organized, thorough, hardworking, self-disciplined, responsible, cautious, and thrifty*. Extraversion was measured by five adjectives: *outgoing, talkative, active, friendly, and lively*. Agreeableness was measured by five adjectives: *softhearted, sympathetic, caring, warm, and helpful*. Last, neuroticism was measured by four adjectives: *nervous, worrying, moody, and not calm*. The Big Five traits demonstrated acceptable to good internal reliability with Cronbach's Alpha scores of .80 for openness, .73 for conscientiousness, .78 for extraversion, .81 for agreeableness, and .73 for neuroticism.

**Control variables.** Sociodemographic and financial correlates included age, employment activity (i.e., work), coupled household status, gender, race, education, homeowner and mortgage holding status, nonmortgage related debt (e.g., credit card, family loans, etc.), perceived health status, probability of living another 10 years, financial planning horizon, and likelihood of leaving a bequest of \$100,000.

Age was measured as a continuous variable. All other control variables were measured with discrete or ordinal categories. Those who reported employment activity ("work") were coded as a 1; all other respondents were coded as a 0. Coupled households were coded as a 1; all other households were coded



as a 0. A dichotomous variable was included to control for gender: females were coded as a 1, with males coded as a 0. Whites were coded as a 1, with non-Whites coded as a 0 for race. Two categories were included for education: those with some undergraduate college education or higher were coded as a 1, while those with a high school education or less were coded as a 0. Mortgage and homeowner status were incorporated through three categories: (a) mortgage holding homeowner, (b) nonmortgage holding homeowner, and (c) nonhomeowner. Those that reported any nonmortgage related debt (e.g., credit card, family loans, etc.) were coded as a 1, otherwise 0. Perceived health was measured on a Likert-type scale with potential values ranging from 1 (*excellent*) to 5 (*poor*); responses were reverse coded so that higher scores indicated better perceived health. Financial planning horizon encompassed the respondent's perspective of the time period that is most important to them in planning their family's saving and spending and was measured on a 5-point scale ranging from 1 (*next few months*) to 5 (*longer than 10 years*). Self-reported probability of living another 10 years ranged from 0% to 100%; responses were divided by 10 to produce a 0 to 10 scale to support model estimation. Last, bequest motives were incorporated through a variable measuring the probability (0% to 100%) of leaving a \$100,000 bequest. If respondents reported a 0% likelihood to a precursor question of leaving a \$10,000 bequest, then they were coded as a 0% on the \$100,000 bequest variable. The bequest variable was operationalized with four categories: a) 0% likelihood, b) 1% to 49% likelihood, c) 50% to 99% likelihood, and d) 100% likelihood.

## Data Analysis

A Structural Equation Model with a Confirmatory Factor Analysis was employed using *Mplus* Version 8 to account for measurement error associated with the psychological constructs and to investigate direct and indirect effects between variables (Kline, 2016; Muthén & Muthén, 2017). A maximum likelihood estimator was employed for model estimation to facilitate testing of the indirect effects with 5,000 bootstrap draws (Little, 2013; Muthén & Muthén, 2017; Shrout & Bolger, 2002). All dependent variables (portfolio withdrawal rates, financial self-efficacy, positive affect indicators, negative affect indicators, and the Big Five personality trait indicators) were treated as continuous in the model (Muthén & Muthén, 2017). All control variables were modeled according to the full partial method (Little, 2013).

## Results

### Descriptive Statistics

A summary of the sample characteristics are in Tables 1 and 2. The sample consisted of approximately 47% men and 53% women. The majority were coupled (59%), White (85%), with some college education or more (62%). Respondents had an average age of 70 (range: 54–90). About 38% reported employment activity. About half of the sample had annual income (excluding IRA withdrawals) over \$49,999 (54%), financial assets greater than \$99,999 (53%). Most respondents owned a home (86%). About half of the sample consisted of homeowners

Table 1

*Sample Characteristics of Categorical Variables (N = 3,678)*

Variable	<i>n</i>	%	% (weighted)
Gender			
Female	1963	53.37%	48.80%
Male	1715	46.63%	51.20%
Household status			
Couple	2158	58.67%	60.51%
Single	1520	41.33%	39.49%
Race			
White	3129	85.07%	91.23%
Other	549	14.93%	8.77%
Education			
Less than college	1387	37.71%	32.52%
College or higher	2291	62.29%	67.48%
Working status			
Working	1394	37.90%	45.57%
Not working	2284	62.10%	54.43%
Homeownership & mortgage			
Homeowner, with mortgage	1168	31.76%	36.52%
Homeowner, no mortgage	1980	53.83%	50.49%
Non-homeowner	530	14.41%	12.99%
Presence of other debt			
Yes	1218	33.12%	33.90%
No	2460	66.88%	66.10%
Bequest likelihood of \$100k			
0%	726	19.74%	16.33%
1% to 49%	620	16.86%	15.42%
50% to 99%	1279	34.77%	37.80%
100%	1053	28.63%	30.45%
Financial assets (\$0 excluded)			
\$1 to \$24,999	997	27.11%	23.48%
\$25,000 to \$99,999	740	20.12%	19.35%
\$100,000 to \$249,999	659	17.92%	17.39%
\$250,000 to \$499,999	513	13.95%	15.56%
\$500,000 and above	769	20.91%	24.23%
Household income (excluding IRA withdrawals)			
\$0 to \$24,999	607	16.50%	13.62%
\$25,000 to \$49,999	1067	29.01%	24.81%
\$50,000 to \$74,999	684	18.60%	18.81%
\$75,000 to \$99,999	419	11.39%	12.18%
\$100,000 and above	901	24.50%	30.58%

*Note.* Weighted percentages incorporate the oversampling technique of the Health and Retirement Study. All structural equation model results were computed with *Mplus* with a maximum likelihood (ML) estimator to facilitate testing of the indirect effects with 5,000 bootstrap draws (Little, 2013; Muthén & Muthén, 2017; Shrout & Bolger, 2002). *N* = 3,678.

without mortgage debt (54%). A majority of the sample (67%) did not have any nonmortgage related debt (e.g., credit card, family loans, etc.), and reported a 50% or greater likelihood of leaving a \$100,000 bequest (63%). Respondents had an average financial self-efficacy score of 7.71 (range of 0 to 10), reported a 46% probability of living another 10 years on average, and had positive perceptions of their health status (average = 3.32, range = 1–5). A mean financial planning time horizon of 3.27 (range = 1–5) suggested the next few years (i.e., between one and five years) were the most important to respondents in planning their family's savings and spending, on average. Respondents identified more with the openness, conscientiousness, extraversion, and agreeableness traits and less with the neuroticism trait, on average (see Table 2). Respondents reported an average positive affect score of 3.63 (range 1 to 5), and an average negative affect score of 1.71 (range = 1 to 5).

Table 2  
*Sample Characteristics of Scales and Continuous Variables (N = 3,678)*

Variable	<i>M</i>	<i>SE</i>	Min	Max	Cronbach's Alpha
Log portfolio withdrawal rate	-2.82	.05	-15.18	9.49	—
Age	70.10	.15	54.00	90.00	—
Financial planning horizon	3.27	.02	1.00	5.00	—
Life Expectancy (+10 years)	4.64	.05	.00	10.00	—
Perceived health	3.32	.02	1.00	5.00	—
Situational trait					
Financial self-efficacy	7.71	.04	.00	10.00	—
Compound traits					
Positive affect	3.63	.01	1.00	5.00	.93
Negative affect	1.71	.01	1.00	5.00	.89
Elemental traits					
Openness to experience	2.97	.01	1.00	4.00	.80
Conscientiousness	3.33	.01	1.00	4.00	.73
Extraversion	3.17	.01	1.00	4.00	.78
Agreeableness	3.51	.01	1.00	4.00	.81
Neuroticism	1.95	.01	1.00	4.00	.73

*Note.* All model results were computed with Mplus with a maximum likelihood (ML) estimator to facilitate testing of the indirect effects with 5,000 bootstrap draws (Little, 2013; Muthén & Muthén, 2017; Shrout & Bolger, 2002). *N* = 3,678.

## Missing Data

List-wise deletion was utilized in the data preparation phase; however, missing data was permitted for the elemental traits (i.e., openness, conscientiousness, extraversion, agreeableness, and neuroticism) and compound traits (i.e., positive affect and negative affect). *Mplus* uses all available data to estimate the model using full information maximum likelihood with the maximum likelihood estimator (Muthén & Muthén, 2017). The covariance coverage of the data ranged from 0.979 to 1.0.

## Measurement Model

The measurement model was analyzed with a Confirmatory Factor Analysis (CFA) with indicators for the elemental and compound traits respecified into parcels according to recommended methodology (Little, 2013). Results of the parceled CFA model are provided in the online supplemental materials. Results revealed significant factor loadings across all parceled indicators above the .40 level. For local identification, an equality constraint was imposed for the extraversion, agreeableness, and neuroticism indicators (Little, 2013). The fixed factor method was employed for scale setting in accordance with recommended methodology (Little, 2013).

## Model Fit

The model chi-square exact fit test indicates the model should be tentatively rejected,  $\chi^2(df\ 304) = 3589.55$ ,  $p = <.001$ ; however, this test is highly sensitive to model rejection with an increasing sample size (e.g., over 400 cases; Kenny, 2015; Kline, 2016; Little, 2013). Other fit indices indicated a mediocre to close fit of the data: An RMSEA of .054 (90% CI [.053, .056]) suggested an acceptable model fit, an SRMR of .042 suggested a close model fit, a CFI index of .91 suggested an acceptable model fit, and a TLI index of .85 suggested a mediocre model fit (Little, 2013).

## Structural Model Results

A structural diagram representing the statistically significant direct effects (at  $p < .05$ ) is provided in Figure 1. The structural model was estimated with indicators from the measurement model for the latent variables (see online supplemental materials) and included control variables according to the full partial method (Little, 2013): age, employment activity (i.e., work), couple status, gender, race, education, nonmortgage debt, homeowner and mortgage status, perceived health status, probability of living another 10 years, financial planning horizon, and bequest likelihood. Overall, the model explained 16% of the variability in portfolio withdrawal rates, 23% of the variability in financial self-efficacy, 60% of the variability in positive affect, and 74% of the variability in negative affect.

**Direct effects of sociodemographic and financial characteristics with portfolio withdrawal rates.** The results for the sociodemographic and financial characteristic were largely consistent with existing literature (see Table 3). A higher PWR was associated with older individuals ( $\beta = .13$ ), couples (compared to singles;  $\beta = .16$ ), those with nonmortgage debt (e.g., credit card, family loans, etc.;  $\beta = .12$ ), and those with a greater probability of living another 10 years ( $\beta = .05$ ). A lower PWR was associated with employment activity (i.e., work;  $\beta = -.49$ ), being White (as compared to non-White;  $\beta = -.33$ ), having some undergraduate college education or more (as compared to those with a high school education or less;  $\beta = -.09$ ), having a longer financial planning time horizon ( $\beta = -.04$ ), owning a home without a mortgage (compared to owning a home with a mortgage;  $\beta = -.13$ ), and having a greater than 0% likelihood of leaving a \$100,000 bequest ( $\beta = -.19$ ,  $-.33$ , and  $-.31$ ) for a 1% to 49%, 50% to 99%, and 100% bequest likelihood, respectively.

**Direct effects of the psychological characteristics with portfolio withdrawal rates (PWR).** The psychological characteristics demonstrated significant direct and indirect relationships with PWR after controlling for the sociodemographic and financial

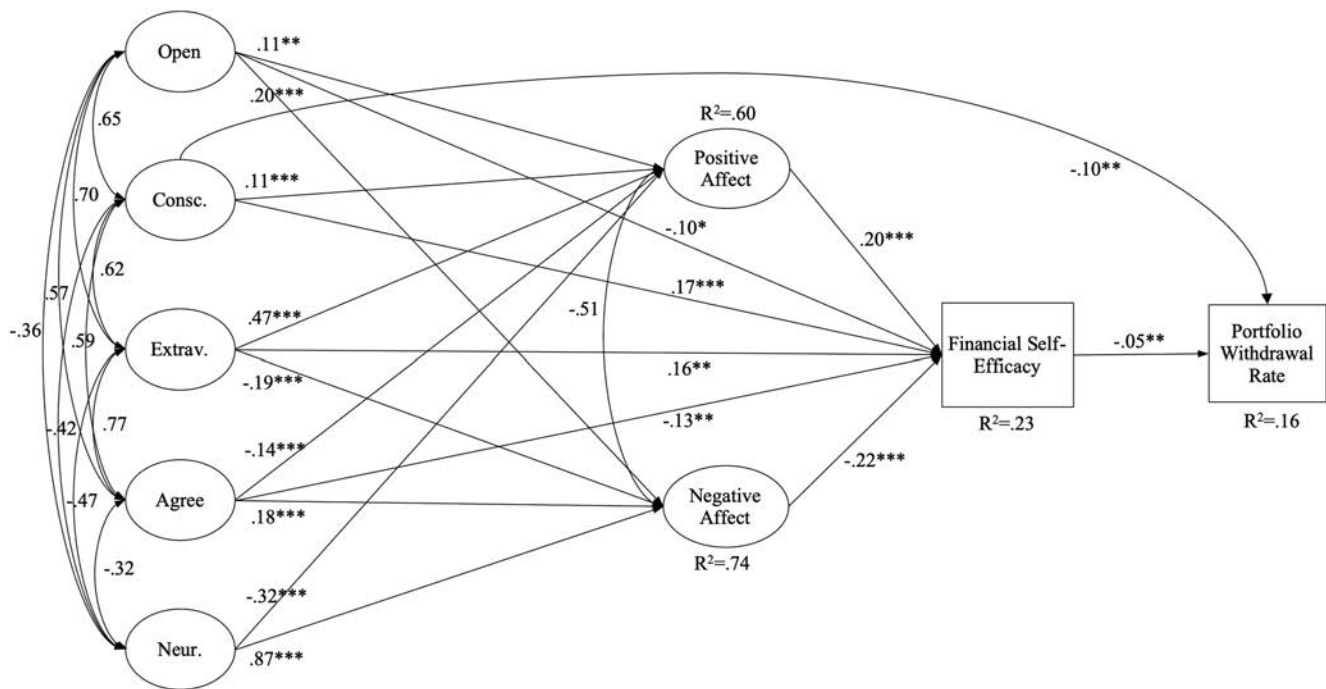


Figure 1. SEM Diagram for Direct Effects ( $N = 3,678$ ). Only significant direct paths at  $p < .05$  are shown. Model fit indices are:  $\chi^2(304) = 3589.55$ ,  $p = < .001$ ; RMSEA = .054, 90% CI [.053, .056]; SRMR = .042; CFI = .91; TLI = .85.  $N = 3,678$ . All results were computed in *Mplus* with a maximum likelihood (ML) estimator to facilitate testing of the indirect effects with 5,000 bootstrap draws (Little, 2013; Muthén & Muthén, 2017; Shrout & Bolger, 2002). Parameter estimates are in STDYX standardization. The structural model was estimated with indicators from the measurement model for the latent variables and included control variables according to the full partial method (Little, 2013): age, working status, couple status, gender, race, education, nonmortgage debt, homeowner and mortgage status, perceived health, financial planning time horizon, probability of living another 10 years, and bequest likelihood. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

characteristics associated with PWR levels. Specifically, the results provided support for hypotheses two (conscientiousness is associated with lower PWR) and eight (financial self-efficacy is associated with lower PWR). Specifically, PWR decreased by 6.76%<sup>1</sup> for every one-unit increase in financial self-efficacy, holding all else constant ( $b = -.07$ ;  $\beta = -.05$ ). Moreover, a one-unit increase in conscientiousness was associated with a 25.17% decline in PWR ( $b = -.29$ ;  $\beta = -.10$ ), holding all else constant. Results did not provide evidence of a direct relationship between the other elemental and compound traits with PWR (H1: openness to experience, H3: extraversion, H4: agreeableness, H5: neuroticism, H6: positive affect, and H7: negative affect).

**Indirect effects of the psychological characteristics with portfolio withdrawal rates (PWR).** For an indirect effect to occur, a significant path from each of the compound traits directly to financial self-efficacy should exist and was observed (see Table 4). Thus, in support of hypothesis nine, compound traits were indirectly connected to PWR through financial self-efficacy (see Table 5). Specifically, greater positive affect was associated with higher financial self-efficacy ( $\beta = .20$ ). Greater negative affect was associated with lower financial self-efficacy ( $\beta = -.22$ ). The indirect effects from compound traits to portfolio withdrawal rates through financial self-efficacy are provided in Table 5. Holding all else equal, the significant indirect effects between compound traits

and PWR were  $-.01$  ( $.20 \times -.05$ ) for positive affect, and  $.01$  ( $-.22 \times -.05$ ) for negative affect. Thus, greater positive affect was indirectly associated with lower PWR through higher financial self-efficacy, and negative affect was indirectly associated with higher PWR through lower financial self-efficacy. Moreover, results revealed a direct relationship between the elemental traits and financial self-efficacy (see Table 4). Greater openness and agreeableness were associated with lower financial self-efficacy ( $\beta = -.10$ , and  $\beta = -.13$ , respectively), whereas greater conscientiousness and extraversion were associated with higher financial self-efficacy ( $\beta = .17$ , and  $\beta = .16$ , respectively). These direct relationships facilitated an indirect relationship with PWR through financial self-efficacy (see Table 5). Greater conscientiousness and extraversion were indirectly associated with lower PWR through higher financial self-efficacy ( $\beta = -.009$ , and  $\beta = -.009$ , respectively). Greater agreeableness was associated with higher PWR through lower financial self-efficacy ( $\beta = .007$ ). Bootstrap estimation results with 5,000 draws provided support for the significance of these indirect effects because the confidence interval

<sup>1</sup> Interpretation of parameter estimates of a log dependent variable: Percentage change in  $Y$  for every one-unit change in  $X = (e^b - 1) \times 100$  (Benoit, 2011; Harness, Finke, & Chatterjee, 2009).

Table 3  
*Direct Effects With Portfolio Withdrawal Rates (Dependent Variable), N = 3,678*

Parameter	Unstandardized		Standardized	
	Estimate	SE	Estimate	SE
Situational trait				
Financial self-efficacy	-.07**	.03	-.05**	.02
Compound traits				
Positive affect	.01	.06	.01	.03
Negative affect	-.02	.08	-.01	.05
Elemental traits				
Openness	.09	.11	.03	.04
Conscientiousness	-.29**	.09	-.10**	.03
Extraversion	-.10	.15	-.03	.05
Agreeableness	.20	.13	.07	.04
Neuroticism	-.13	.17	-.05	.06
Control variables				
Age	.04***	.01	.13***	.02
Work	-1.48***	.12	-.49***	.04
Couple	.49***	.11	.16***	.04
Female	.09	.12	.03	.04
Race white	-1.00***	.14	-.33***	.05
College education	-.26*	.11	-.09*	.04
Non-mortgage debt	.35**	.10	.12**	.03
Perceived health	-.04	.06	-.01	.02
Life expectancy (+10 yrs)	.05**	.02	.05**	.02
Financial planning horizon	-.11**	.04	-.04**	.02
Homeowner, with mortgage (comparison group)	—	—	—	—
Homeowner, no mortgage	-.38**	.11	-.13**	.04
Non-homeowner	-.29†	.16	-.10†	.05
\$100k bequest 0% (comparison group)	—	—	—	—
\$100k bequest 1% to 49%	-.58***	.16	-.19***	.05
\$100k bequest 50% to 99%	-.98***	.14	-.33***	.05
\$100k bequest 100%	-.93***	.15	-.31***	.05
R <sup>2</sup>	.16			

*Note.* All structural equation model results were computed in *Mplus* with a maximum likelihood (ML) estimator to facilitate testing of the indirect effects with 5,000 bootstrap draws (Little, 2013; Muthén & Muthén, 2017; Shrout & Bolger, 2002). A chi-square difference test was conducted on the direct effects as a robustness check for statistical significance given the Health and Retirement Study's complex sample design; results support the significance of the direct effects reported in this table. Standardized results are provided in STDYX standardization for continuous independent variables and STDY standardization for binary independent variables.

†  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

for each effect did not contain zero (see Table 5; Shrout & Bolger, 2002). Although the openness to higher PWR path through lower financial self-efficacy ( $\beta = .005$ ,  $p < .10$ ) was not significant at  $p < .05$ , the 95% confidence interval did not contain zero, thereby providing evidence of significance for this indirect path.

Results also supported hypothesis 10: elemental traits are indirectly connected to portfolio withdrawal rates through combinations of situational and compound traits. The direct effects between elemental and compound traits necessary for the indirect effects are provided in Table 6; the indirect effects from elemental traits to portfolio withdrawal rates (through compound and situational traits) are provided in Table 7.

Significant direct effects between elemental traits and compound traits were observed (see Table 6). Specifically, openness was associated with greater positive affect ( $\beta = .11$ ) and greater negative affect ( $\beta = .20$ ). Conscientiousness was associated with greater positive affect ( $\beta = .11$ ). Extraversion was associated with greater positive affect ( $\beta = .47$ ) and lower negative affect ( $\beta = -.19$ ). Agreeableness was associated with lower positive affect ( $\beta = -.14$ ) and greater negative affect ( $\beta = .18$ ). Finally,

neuroticism was associated with lower positive affect ( $\beta = -.32$ ) and greater negative affect ( $\beta = .87$ ).

These direct relationships facilitated indirect effects for the openness, extraversion, agreeableness, and neuroticism traits to PWR through combinations of positive affect, negative affect, and financial self-efficacy. Openness had a positive indirect relationship with PWR through greater negative affect and lower financial self-efficacy ( $\beta = .002$ ). Extraversion had a negative indirect relationship with PWR through greater positive affect and higher financial self-efficacy ( $\beta = -.005$ ), and lower negative affect and higher financial self-efficacy ( $\beta = -.002$ ). Agreeableness had a positive indirect relationship with PWR through greater negative affect and lower financial self-efficacy ( $\beta = .002$ ). Neuroticism had a positive indirect relationship with PWR through lower positive affect and lower financial self-efficacy ( $\beta = .003$ ), and greater negative affect and lower financial self-efficacy ( $\beta = .01$ ). Thus, those with greater extraversion were associated with lower PWR, whereas higher levels of openness, agreeableness, and neuroticism were associated with higher PWR. Bootstrap estimation results with 5,000 draws provided support for the significance of



Table 4  
*Direct Effects for Compound and Elemental Traits With Financial Self Efficacy (Dependent Variable), N = 3,678*

Parameter	Unstandardized		Standardized	
	Estimate	SE	Estimate	SE
Compound traits				
Positive affect	.27***	.04	.20***	.03
Negative affect	-.25***	.06	-.22***	.05
Elemental traits				
Openness	-.19*	.08	-.10*	.04
Conscientiousness	.34***	.06	.17***	.03
Extraversion	.33**	.11	.16**	.05
Agreeableness	-.26**	.09	-.13**	.04
Neuroticism	.23 <sup>†</sup>	.12	.12 <sup>†</sup>	.06
R <sup>2</sup>	.23			

Note. All structural equation model results were computed in *Mplus* with a maximum likelihood (ML) estimator to facilitate testing of the indirect effects with 5,000 bootstrap draws (Little, 2013; Muthén & Muthén, 2017; Shrout & Bolger, 2002). Standardized results are provided in STDYX standardization.

<sup>†</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

these indirect effects because the confidence interval for each effect did not contain zero (see Table 7; Shrout & Bolger, 2002). The indirect effects for conscientiousness through positive affect, negative affect, and financial self-efficacy were not statistically significant because the confidence intervals for these paths included zero (see Table 7).

**Robustness check.** With a substantial portion of the sample reporting employment activity (see Table 1), we completed a robustness check of the results in a subsample of fully retired individuals who did not report any employment activity. The results indicated that the direction, magnitude, and significance of effects were similar across models, albeit with a slight loss of power in the retired-only sample. We retained the full sample that controlled for employment activity given the blurred line between work and retirement and overall consistency of results across models. Furthermore, given the use of the maximum likelihood estimator in *Mplus* for testing the indirect effects with 5,000

bootstrap draws, a chi-square difference test was conducted on the direct effects as a robustness check for statistical significance given the complex sample design of the Health and Retirement Study per recommended methodology (Little, 2013). This test provided support for the significant direct effects in the model. As an additional check, we computed the direct effects using a maximum likelihood estimator with robust standard errors according to recommended guidelines (Nielsen & Seay, 2014). Direct effect results for the psychological effects with PWR using the maximum likelihood with robust standard errors method were consistent with slight differences in effect size (i.e., financial self-efficacy and conscientiousness had significant negative effects with PWR with both estimators).

## Discussion

The psychological characteristics demonstrated significant direct and indirect relationships with PWR after accounting for sociodemographic and financial factors that affect retirement spending decisions. The sociodemographic and financial results were consistent with previous literature. Specifically, older individuals, couples, a higher expected probability of living another 10 years, and those with nonmortgage debt (e.g., credit card, family loans, etc.) exhibited higher PWR. Poterba et al. (2015) found that age and PWR were positively related and noted that increasing health care costs over time likely contributed to this relationship. Browning (2018) found that increased longevity expectations were positively associated with PWR and noted that this relationship may stem from the positive relationships between longevity, health, and wealth. Nonmortgage debt places a greater strain on the portfolio, thereby resulting in higher portfolio withdrawals to support it and/or eliminate it. Furthermore, individuals with higher financial literacy have been found to carry low levels of nonmortgage debt (Disney & Gathergood, 2013) and are more likely to self-manage their retirement portfolios as a result of increased confidence and familiarity with financial products (Agnew, Anderson, Gerlach, & Szykman, 2008).

Having some college education or more (compared to high school or less), being a mortgage-free homeowner, having a be-

Table 5  
*Indirect Effects for Elemental and Compound Traits With Portfolio Withdrawal Rates (PWR) Through Financial Self Efficacy (FSE), N = 3,678*

Parameter	Unstandardized		Standardized		CI	
	Estimate	SE	Estimate	SE	Lower 2.5%	Upper 2.5%
Compound traits to PWR through FSE (indirect effect)						
Positive affect → FSE → PWR	-.020**	.01	-.010**	.00	-.020	-.004
Negative affect → FSE → PWR	.018*	.01	.012*	.01	.003	.026
Elemental traits to PWR through FSE (indirect effect)						
Openness → FSE → PWR	.014 <sup>†</sup>	.01	.005 <sup>†</sup>	.00	.001	.013
Conscientiousness → FSE → PWR	-.025**	.01	-.009**	.00	-.017	-.003
Extraversion → FSE → PWR	-.024*	.01	-.009*	.00	-.020	-.002
Agreeableness → FSE → PWR	.019*	.01	.007*	.00	.002	.016
Neuroticism → FSE → PWR	-.017	.01	-.006	.00	-.019	.000

Note. All structural equation model results were computed in *Mplus* with a maximum likelihood (ML) estimator to facilitate testing of the indirect effects with 5,000 bootstrap draws (Little, 2013; Muthén & Muthén, 2017; Shrout & Bolger, 2002). CI = 95% confidence interval for standardized estimates. Significance is supported only if the 95% CI does not include zero.

<sup>†</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ .

Table 6  
*Direct Effects for Elemental Traits With Positive Affect and Negative Affect (Compound traits; Dependent Variables), N = 3,678*

Parameter	Unstandardized		Standardized	
	Estimate	SE	Estimate	SE
Positive affect				
Openness	.16**	.05	.11**	.03
Conscientiousness	.16***	.04	.11***	.03
Extraversion	.68***	.07	.47***	.05
Agreeableness	-.21***	.06	-.14***	.04
Neuroticism	-.46***	.03	-.32***	.02
R <sup>2</sup>	.60			
Negative affect				
Openness	.36***	.07	.20***	.04
Conscientiousness	-.08	.06	-.04	.03
Extraversion	-.34***	.09	-.19***	.05
Agreeableness	.34***	.08	.18***	.04
Neuroticism	1.55***	.10	.87***	.02
R <sup>2</sup>	.74			

*Note.* All structural equation model results were computed in *Mplus* with a maximum likelihood (ML) estimator to facilitate testing of the indirect effects with 5,000 bootstrap draws (Little, 2013; Muthén & Muthén, 2017; Shrout & Bolger, 2002). Standardized results are provided in STDYX standardization.

\*\* $p < .01$ . \*\*\* $p < .001$ .

quest motive, being White, having a longer financial planning time horizon, and having employment income were associated with lower PWR. The results for bequests and employment income were expected, as bequests create a demand for end-of-life resources and having employment income reduces the portfolio distribution burden. The results for education and mortgage-free homeownership suggested that those with potential capacity for greater portfolio spending do not exhibit a greater rate of withdrawal from their financial accounts. Poterba, Rauh, Venti, and Wise (2007) found education to be positively related to retirement wealth, and being mortgage-free reduces the demand for ongoing

housing-related cash flows, which would each create an increased capacity to spend from the retirement portfolio, potentially resulting in a higher PWR. However, from a psychological perspective, these individuals have demonstrated the financial behaviors necessary to accumulate wealth and reduce debt. Therefore, more conservative portfolio spending decisions might result if this saving orientation and associated financial habits persist into the asset decumulation phase. Furthermore, mortgage-free homeowners have lower fixed costs than those with a mortgage and may choose to maintain their other lifestyle expenses (instead of increasing them) post mortgage payoff, resulting in lower portfolio withdrawal rates than their debt-holding counterparts.

Conscientiousness and financial self-efficacy emerged as the strongest direct psychological predictors of PWR, supporting hypotheses two and eight. Individuals with greater conscientiousness and financial self-efficacy tend to exhibit increased levels of financial planning, organization, control, and prudent financial behavior (e.g., saving). In this study, these characteristics revealed a direct relationship with lower PWR. An interesting consideration is how psychological characteristics influence financial habits and how financial habits persist across various stages of the life cycle. Habits have been found to form naturally as a result of goals (Aarts, Verplanken, & Knippenberg, 1998). When positive habits are developed it may be difficult to break those habits as a result of the positive emotions and outcomes that have been experienced as a result of certain actions (Aarts, Paulussen, & Schaalma, 1997). This may result in preferences for actions that are perceived to be constructive (saving) and distaste for actions that would have impeded progress toward previous goals (spending out of savings). Therefore, a possible explanation for a slowed PWR of those with higher conscientiousness and financial self-efficacy could be the persistence of preferences for preretirement saving habits and ineffective mental reframing of resources to current income or assets with a lower marginal propensity to consume (Shefrin & Thaler, 1988). Alternatively, a lower PWR could simply mean high conscientious and financial self-efficacy individuals are effective in controlling their spending at an appropriate level in

Table 7  
*Indirect Effects for Elemental Traits to Portfolio Withdrawal Rates (PWR) Through Positive and Negative Affect (Compound), and Financial Self-Efficacy (FSE; Situational Trait), N = 3,678*

Parameter	Unstandardized		Standardized		CI	
	Estimate	SE	Estimate	SE	Lower 2.5%	Upper 2.5%
Elemental traits to PWR through compound traits and FSE (indirect effects)						
Openness → Positive affect → FSE → PWR	-.003*	.00	-.001*	.00	-.003	.000
Openness → Negative affect → FSE → PWR	.006*	.02	.002*	.00	.001	.006
Conscientiousness → Positive affect → FSE → PWR	-.003*	.00	-.001*	.00	-.003	.000
Conscientiousness → Negative affect → FSE → PWR	-.001	.00	-.001	.00	-.002	.000
Extraversion → Positive affect → FSE → PWR	-.014**	.01	-.005**	.00	-.010	-.002
Extraversion → Negative affect → FSE → PWR	-.006*	.00	-.002*	.00	-.006	-.001
Agreeableness → Positive affect → FSE → PWR	.004*	.00	.001*	.00	.000	.003
Agreeableness → Negative affect → FSE → PWR	.006*	.00	.002*	.00	.001	.005
Neuroticism → Positive affect → FSE → PWR	.009**	.00	.003**	.00	.001	.007
Neuroticism → Negative affect → FSE → PWR	.028*	.01	.010*	.00	.003	.022

*Note.* All structural equation model results were computed in *Mplus* with a maximum likelihood (ML) estimator to facilitate testing of the indirect effects with 5,000 bootstrap draws (Little, 2013; Muthén & Muthén, 2017; Shrout & Bolger, 2002). CI = 95% confidence interval for standardized estimates. Significance is supported only if the 95% CI does not include zero.

\* $p < .05$ . \*\* $p < .01$ .

retirement. Thus, it is important to note that the meaning of a high or low PWR should be interpreted relative to an individual's financial situation, longevity risk, and goals.

Higher levels of extraversion and conscientiousness were each indirectly associated with lower PWR, supporting hypotheses two and three. Similar to conscientiousness (discussed above), individuals high in extraversion tend to exhibit wealth accumulation tendencies during the preretirement years and may continue this behavior into the wealth decumulation phase. Extraversion has been linked to increased levels of optimism and increased positive emotions. Guven (2012) found that positive emotions preceded prudent financial behaviors, such as saving behavior and controlled spending. Results also revealed that positive emotions had an indirect relationship with lower PWR, supporting hypothesis six. This finding is consistent with the financial behavior literature noted above, where positive emotions are connected to saving-oriented actions and controlled spending.

Higher levels of openness, agreeableness, and neuroticism were each indirectly associated with higher PWR, supporting hypotheses one, four, and five. Neuroticism and negative emotions (e.g., fear, stress, and worry) may decrease the likelihood of developing a retirement income plan, and for those that do plan, decrease the likelihood of sticking to the plan due to a lack of confidence in the plan's ability to meet their long-term income needs (Hung, Meijer, Mihaly, & Yoong, 2009). This may cause an overreliance on the status-quo. Furthermore, impulsive financial behavior and poorly timed investment decisions associated with negative emotions may result in higher PWR due to poorer portfolio performance and higher withdrawals (Durand et al., 2008). Results also revealed that negative emotions had an indirect relationship with higher PWR, supporting hypothesis seven. This finding is consistent with the financial behavior literature noted above, where negative emotions tend to undermine planning-oriented behavior and controlled portfolio decisions. Those with a greater agreeableness trait have been found to have lower levels of wealth, less risky portfolio allocations, and more impulsive spending habits. Those with higher agreeableness may also be more inclined to provide ongoing support for family members and valued charitable organizations. While this may strain the portfolio, it is also worth noting that agreeableness has been found to be one of the few predictors of life satisfaction and positive experiences in retirement (Robinson, Demetre, & Corney, 2010). Last, individuals with higher levels of openness exhibited poorer money management behavior, although they have been shown to embrace life experiences and be less materialistic (Troisi et al., 2006).

There are limitations to this study that should be noted. First, it was not possible to determine the proportion of portfolio distributions spent versus deposited to other accounts and accumulated for future use within the data set used for this study. Therefore, all dollars withdrawn from the portfolio within the survey year are assumed to be included in the portfolio withdrawal rate. Furthermore, as defined by the Health and Retirement Study, "pension" income encompasses both defined contribution and defined benefit employer-sponsored retirement plans. Thus, ongoing and regular "pension" income sources were included as a portfolio distribution so that defined contribution plans (e.g., 401k, 403b, etc.) were accounted for. Second, although the Health and Retirement Study was designed to be nationally representative of American adults age 50 and over in the United States, this study utilized a subpop-

ulation with financial assets and portfolio withdrawals greater than zero. Therefore, the sample in this study is no longer nationally representative of the older adult population in the United States. Thus, inferences only apply to the specific subsample with financial assets and portfolio distributions greater than zero. Third, due to data set limitations, this study did not control for the receipt of financial advice. It is possible that there are a number of respondents acting upon financial advice to make their portfolio withdrawal decisions. However, even with this potential noise in the model, the effect of personality type and psychological characteristics still emerged. Last, based upon the design of the Health and Retirement Survey, there is a time gap between the psychosocial data and core survey data. The collection period for the 2014 HRS core data (PWR, sociodemographic and financial control variables) was March, 2014 through April 2015. The personality and psychological questions are part of the leave-behind psychosocial questionnaire, which is a self-administered questionnaire that is left behind with the respondent after the enhanced face-to-face core interview to be completed on their own and returned by mail. Thus, the completion dates of the psychosocial measures were not gathered at the exact same time point as the core data and will vary across respondents. Furthermore, as stated in the data and sample section, the psychosocial data collection scheme rotates through half the sample at each core interview. Therefore, we included data from the 2012 psychosocial survey to capture data for the full sample.

## Implications and Conclusion

Previous portfolio withdrawal strategies have focused on technical models to explain portfolio withdrawal decisions (MacDonald et al., 2013; Milevsky & Huang, 2011). This study expanded our understanding of portfolio withdrawal rates (PWR) beyond these technical strategies by investigating how the human dimension of the decision-making process explains variability in PWR levels. This study fills a gap in the literature regarding the behavioral mechanisms that might affect portfolio drawdown decisions. Overall, results reveal a story that is consistent with what is currently reflected in the saving and spending literature, suggesting that those who are successful in accumulating wealth for retirement transfer their saving-oriented behavioral tendencies into their portfolio withdrawal decisions. Findings from this study provide insight to practitioners and researchers as they explore retirement income planning beyond its technical aspects and seek to better understand what motivates clients' retirement spending decisions.

Results suggest that financial professionals might benefit from performing a personality assessment on clients, as it may reveal characteristics and attitudes that influence their portfolio withdrawal decisions. As a result, financial professionals will be able to deliver tailored recommendations that account for the personality and psychological characteristics underpinning clients' PWR behavior. Characteristics more commonly associated with saving and wealth accumulation behavior (conscientiousness, extraversion, positive affect, and financial self-efficacy) were directly and/or indirectly associated with lower portfolio withdrawal rates. This is a positive outcome if it protects clients from overspending. However, if these characteristics relate to overly conservative spending, clients may lose utility from forgone consumption. Conversely, openness, agreeableness, neuroticism, and negative affect (charac-

teristics commonly associated with less favorable financial decisions and lower wealth accumulation outcomes) are indirectly related to higher portfolio withdrawal rates. Clients possessing these characteristics may be more prone to impulsive spending and be at greater risk of depleting the retirement portfolio. Identifying and understanding these relationships can inform financial planners and consumers about the characteristics and attitudes that clients bring to the relationship and that influence their behavioral choices. With this insight, financial planners can more actively engage their clients, understand what triggers their financial behavior, and guide them to more favorable long-term financial outcomes.

Finally, this study is the first to use psychological theory to explain portfolio withdrawal rates, thereby making a significant contribution to a body of literature that has historically focused on technical factors. Researchers can use the findings from this study to support future investigation into PWR. For example, this study focused on the effect of individual personality types and psychological characteristics with PWR. Future research could investigate personality trait interaction effects both within individuals and within couples to gain a deeper understanding of how traits and psychological characteristics combine individually and within the household to influence PWR behavior. It is important to note that the psychological findings were robust after controlling for sociodemographic and financial characteristics that have been shown to affect portfolio withdrawal rate decisions, underscoring the relevance of psychological factors for portfolio withdrawal rate behavior. Overall, results highlight the utility of psychological modeling in the portfolio withdrawal rate space and lay a foundation for future research.

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