THREE ESSAYS ON PERSONALITY AND NET WORTH

by

GEORGE NABESHIMA

M.U.R.P., University of Hawaii, 1994

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Family Studies and Human Services
College of Human Ecology

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2014

Abstract

This dissertation consists of three studies exploring the relationship between personality and wealth related variables. Psychological type theory was used as the theoretical framework for the first two studies, while the doctrine of interactionism was used in the third study. All three studies utilized data from the 2010 panel of the Health and Retirement Study (HRS).

The first study examined the relationship between personality traits and net worth. Linear regression results identified the extroversion and conscientiousness traits as being positively associated with net worth. Furthermore, the agreeableness trait was negatively associated with net worth.

The second study explored the relationship between personality preference and stock ownership. This study's logistic regression results identified the preference for high openness and high neuroticism as significant and positively associated with stock ownership. A high agreeableness preference was significant and negatively associated with stock ownership.

The focus of the third study examined how net worth and income mediated the association between personality and life satisfaction. Regression results from this study identified net worth as being a significant mediating variable in the association between the conscientiousness trait and life satisfaction levels. However, income, in addition to net worth, was also a significant mediating variable when the extroversion and neuroticism traits were used to represent personality trait variables.

Results from the three studies identified significant associations between personality traits and components of net worth. These findings contribute to the financial planning field by

providing useful information in regards to how mental preferences expressed outwardly though personality traits are related to wealth related variables and life satisfaction. Financial planning practitioners can apply these findings to formulate strategies to assist people grow their wealth levels.

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Table of Contents

List of Figures xii

List of Tables xiii

Acknowledgements xvi

Dedication xvii

Chapter 1 - Introduction 1

Description of Studies 5

References 7

Chapter 2 - The Association between Personality and Net Worth 9

Introduction 9

Literature Review 10

Intertemporal Models 10

Demographic Factors 12

Psychological Variables 13

Theoretical Overview 16

Associations between Personality and Financial Behavior 20

Methodology 24

Data and Sample 24

Variables 26

Empirical Model 31

Statistical Analysis 33

Results 34

Descriptive Statistics 34
Regression Analysis Results 38
Interaction Regression Analysis Results 40
Discussion 47
Conclusion 50
References 54
Chapter 3 - The Association between Personality and Stock Ownership 61
Introduction 61
Literature Review 62
Psychological Variables 63
Demographic Factors 64
Theoretical Framework 67
Methodology 74
Data and Sample 74
Variables 75
Empirical Model 80
Statistical Analysis 82
Results 84
Descriptive Statistics 84
Regression Analysis Results for Model One (Control Variables) 88
Regression Results for Model Two (Individual Personality Preference) 92
Regression Results for Personality Preference Interaction Models 93
Discussion 100

Conclusion 104
References 107
Chapter 4 - Money as a Mediator Between Personality and Happiness 114
Introduction 114
Literature Review 115
Addition of Personality into Money and Life Satisfaction Research 116
Personality and Life Satisfaction 117
Net Worth as an Alternative Proxy for Money 118
Other Demographic Variables 118
Theoretical Framework 119
Methodology 122
Data and Sample 122
Conceptual Model 127
Statistical Analysis 130
Results 132
Descriptive Statistics 132
Regression Result Organization 135
Analysis Results (Total Effect) 136
Analysis Results (Mediation Model) 138
Discussion 145
Conclusion 155
References 159
Chapter 5 - Conclusion 164

Introduction 164

Essay One 164

Essay Two 165

Essay Three 166

Conclusion 167

References 169

List of Figures

Figure 2.1 Psychology type theories 16

Figure 4.1 Doctrine of Interaction Schematic Diagram (adpated from Kihlstrom, 2013) 120

Figure 4.2 Conceptual Model for a Simple Relationship between Two Variables 128

Figure 4.3 Simple Mediation Conceptual Model 129

Figure 4.4 Multiple Mediation Conceptual Model Example 130

Figure 4.5 Statistical Model for a Simple Relationship between Money and Subjective Well-Being 131

Figure 4.6 Statistical Mediation Model between Personality and Subjective Well-Being Mediated by Two Money Variables 131

Figure 4.7 Mediation Model between Extroversion and Life Satisfaction as Mediated by Net Worth and Income 147

Figure 4.8 Mediation Model between Agreeableness and Life Satisfaction as Mediated by Net Worth and Income 149

Figure 4.9 Mediation Model between Conscientiousness and Life Satisfaction as Mediated by Net Worth and Income 151

Figure 4.10 Mediation Model between Openness and Life Satisfaction as Mediated by Net Worth and Income 153

Figure 4.11 Mediation Model between Extroversion and Life Satisfaction as Mediated by Net Worth and Income 155

List of Tables

Table 2.1 Corresponding Big Five traits and Psychological Personality Types.....19

Table 2.2 Measurement of Individual Personality Trait Variables.....27

Table 2.3 Coding of Interacting Personality Trait Variables.....28

Table 2.4 Measurement of Dependent and Control Variables.....29

Table 2.5 Expected Relationship between Independent Variables and Dependent Variable (Net Worth).....32

Table 2.6 Descriptive Statistics.....36

Table 2.7 Linear Regression Results - Demographic and Personality Variables **C**ontributing to Net Worth.....39

Table 2.8 Linear Regression Results - Interaction of Extroversion and Openness **C**ontributing to Net Worth.....41

Table 2.9 Linear Regression Results - Interaction of Extroversion and Agreeableness **C**ontributing to Net Worth.....43

Table 2.10 Linear Regression Results - Interaction of Openness and Agreeableness Contributing to Net Worth.....45

Table 3.1 Type Dimensions in the Psychological Type Theory.....68

Table 3.2 Big Five Personality Traits and Related Type Domains.....70

Table 3.3 Personality Trait Preference Coding Format.....76

Table 3.4 Coding of Interacting Personality Trait Variables.....77

Table 3.5 Measurement of Dependent and Control Variables.....78

Table 3.6 Expected Relationship between Independent Variables and Stock Ownership.....81

Table 3.7 Descriptive Statistics, Continuous Variables (Weighted Percent and Mean).....86

Table 3.8 Descriptive Statistics, Categorical Variables (Weighted Percent).....86

Table 3.9 Logistic Regression Results – Demographic Variables and Personality Preference Contributing to Stock Ownership 90

Table 3.10 Logistic Regression Results – Demographic Variables, Personality Preference, and Preference Interaction of Extroversion and Agreeableness **C**ontributing to Stock Ownership.....93

Table 3.11 Logistic Regression Results – Demographic Variables, Personality Preference, and Preference Interaction of Extroversion and Openness Contributing to Stock Ownership.....96

Table 3.12 Logistic Regression Results – Demographic Variables, Personality Preference, and Preference Interaction of Openness and Agreeableness **C**ontributing to Stock Ownership.....98

Table 4.1 Measurement of Dependent and Independent Variables 124

Table 4.2 Expected Relationship between Independent Variables and Dependent Variable (Life Satisfaction) 127

Table 4.3 Descriptive Statistics.....134

Table 4.4 Linear Regression Coefficients and Standard Errors for the Total Effect Association between Personality Traits (Independent Variable) and Life Satisfaction (Dependent Variable) 137

Table 4.5 Linear Regression Coefficients and Standard Errors for the Direct Effect Association between Personality Traits (Independent Variable) and Life Satisfaction (Dependent Variable) 139

Table 4.6 Linear Regression Coefficients and Standard Errors for the Indirect Path using Income as Mediator between Personality Variables and Life Satisfaction.....142

Table 4.7 Linear Regression Coefficients and Standard Errors for the Indirect Path using Net Worth as Mediator between Personality Variables and Life Satisfaction 143

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Dedication

To Mommy and Daddy, I am who I am because of your love.

To the Love of my life, thank you for believing in me.

Chapter 1 - Introduction

The purpose of this dissertation was to examine the relationship between the role of personality and wealth building. Literature regarding growing one's net worth through savings is well defined in some areas and incomplete in others. For example, much is already understood in academic literature regarding the demographic nature of those who are more likely to save and those who are less likely to save. Previous research has identified factors, such as age, gender, education, race, and income as just a few of the many demographic factors related to savings and net worth (Bucks, Kennickell, & Moore, 2006). However, less is known in the area of why people save (DeVaney, Anong, & Whirl, 2007).

Various theories provide potential explanations regarding the motivation for savings. For example, intertemporal theories, such as absolute income hypothesis, permanent income hypothesis, life cycle hypothesis, and behavioral life cycle hypothesis, generally explain savings through the lens of consumption (Bryant & Zick, 2006). In John Keynes' absolute income hypothesis, savings is the result of an individual's marginal propensity to consume based upon one's income. As one's income increases, so does one's marginal propensity to consume; however, the rate of increase with consumption occurs at a rate less than that of the income increase rate and, thus more savings occur as income rises. In the permanent income and life cycle hypotheses, savings act as a means to spread out income over time for consumption purposes (Bryant & Zick, 2006). The permanent income and life cycle hypotheses are relatively similar. However, the permanent income hypothesis infers more savings than the life cycle hypothesis. This increased savings is because the life cycle hypothesis infers all financial assets to be consumed by one's date of death, while the permanent income hypothesis allows for the

creation of a savings account to provide income into perpetuity (Ando & Modigliani, 1963). Behavioral life cycle hypothesis attempts to explain savings in a way similar to the traditional life cycle hypothesis model but allows for cognitive biases, such as mental accounting and framing as self-control strategies to guard against temptations for dis-saving (Shefrin & Thaler, 1988). According to this approach, savings are allocated to different accounts, and each account is assigned a different propensity to save level. For example, people may perceive and access a retirement account differently from that of a cash reserve account, even though monies in each account hold the same financial value (DeVaney, Anong, & Whirl, 2007).

One weakness of most intertemporal models is that only economic factors are identified as motives for savings. The exception is the behavioral life cycle hypothesis, where factors other than economics may influence savings (potential cognitive biases, as in the case of this approach). As a result, researchers have acknowledged the need to expand saving motivations, and alternative theories have looked at psychological needs-based factors as additional motives for savings. A number of researchers have utilized Maslow's hierarchy of needs to explain savings motives beyond an economic realm (Xiao & Noring, 1994; DeVaney, Anong, & Whirl, 2007; Howell, Kurai, & Tam, 2013). In these studies, savings motives were organized into a hierarchical framework based upon Maslow's hierarchy of five basic needs. These needs included physiological, safety and security, belonging, self-esteem, and self-actualization (Boeree, 2006). In this hierarchical framework, initial financial resources are allocated to basic physiological needs, such as those daily expenses related to food and basic shelter (Xiao & Noring, 1994). Once basic needs were met, then savings could occur. Individuals may be motivated to save money as part of an emergency fund to fulfill an immediate safety and security need to achieve peace of mind, or save money as part of a retirement plan for one's financial

security need in the future (DeVaney, Anong, & Whirl, 2007). Another saving motivation example at a higher hierarchical level includes individuals' desires to save for their children's future education expenses (DeVaney, Anong, & Whirl, 2007). This type of saving motivation could be the product of a potential belonging or societal need. Also related to the need to belong, individuals may be motivated to save to increase their chances of finding a marital partner by making themselves appear more financially attractive (Schneider, 2011). Examples of saving motivations at the highest hierarchical levels representing self-esteem and self-actualization include the motivation to save and build individual net worth to improve one's self-image via financial social comparison with others (Traut-Mattausch & Jonas, 2011) and to create more options for oneself in order to achieve potential self-actualization goals (DeVaney, Anong, & Whirl; Howell, Kurai, & Tam, 2013).

The previously discussed theories were provided for context in regards to saving motivations. However, observations regarding income and savings do not always support these theories in a way one would expect. Using the life cycle hypothesis as a guide, Fisher and Montalto (2011) found income and savings to be related at lower income levels only; they did not find any significance between income and savings at higher income levels. Essentially, they found that lower incomes prevented savings, but higher income did not necessarily predict the likelihood of savings. In other research, Thaler and Benartzi (2004) reported that participants within defined contributions plans did not save enough of their incomes for retirement even after they were provided with the necessary information regarding how much they needed to save. The researchers cited insufficient individual willingness and will power as one reason participants did not contribute sufficient amounts to their retirement plans. Income and savings have also delivered mixed results when utilizing Maslow's hierarchy of needs as a framework.

DeVaney, Anong, and Whirl (2007) were not able to identify income as a significant factor for saving within all hierarchical need levels. Their study found that a lack of income did prevent saving, and excess income was significant in saving for self-esteem and self-actualization goals. But, income was not significant in regards to savings needs related to safety, security, and belonging.

A gap exists in the area of understanding people's saving motivations that is not completely explained by existing theories, such as those of traditional intertemporal models and needs based frameworks. Past research literature has acknowledge this deficiency and has suggested incorporating psychological factors to further understand savings and net worth accumulation behavior (DeVaney, Anong, & Whirl, 2007). The purpose of this dissertation was to explore how the role of one psychological element, specifically personality, plays in building one's net worth and savings behavior. Personality served as a good candidate to explore in understanding the nature of savings and net worth. Previous research has already found an association between personality and financial decision making (Parker & Spears, 2002; Mckenna, Hyllegar, & Linder, 2003; Pompian & Longo, 2004). Furthermore, there are many dimensions of personality, and within each dimension, there exists a wide range of variability. One possible reason for this variability is to create diversification among the mental mechanisms between individuals to improve the survivability of the human species as part of an evolutionary process (Tooby & Cosmides, 1990; McAdams & Pals, 2006; Nettle, 2007). Potentially, this range of variability of personality trait dimensions and diversification is also influencing net worth development. For this dissertation, the dimensions of various personality traits were explored. The overarching research question this dissertation investigated was "What are the associations between personality traits and savings as expressed by individuals' net worth?"

Developing an understanding of this association can provide individuals, practitioners, and academicians an improved awareness for how personality traits can influence financial decision making and how to develop appropriate strategies to enhance both the effectiveness of implementing financial plan as well as improving the financial planning experiences for individuals.

In this three-paper dissertation, the theory of psychological type (Jung, 1971) was used as the theoretical framework, representing personality for this research for the first two studies. This theory infers that personality is an outward expression derived from how people focus their energy along with how they perceive and process information (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). The third study incorporated the doctrine of interactionism as the theoretical framework. This theory puts forward that both personality and environment contributes to individual outcomes (Bowers, 1973). This dissertation aimed to contribute to the financial planning literature by examining the relationship between personality and net worth development.

Description of Studies

Personality traits with various dimensions of growing individual net worth were examined with this dissertation. The three studies utilized data from the 2010 RAND data file version of the Health and Retirement Study (HRS) survey. The total size of the sample population used was 5,402, which represented those respondents who completed the personality questions in the psychosocial and lifestyle questionnaire in 2010 within the HRS survey.

The first study, Chapter Two, looked at the relationship between personality and net worth. The purpose of this study was to identify if any significant relationships exist with

different types of personality traits and individual net worth. Specifically, individual personality trait scores were used as independent variables, and net worth served as the dependent variable in a linear regression model, while controlling for relevant demographic variables.

The second study, Chapter Three, built upon the first. People have access to different types of financial assets to accumulate wealth, and personality type has the potential to be associated with the type of financial assets individuals choose to grow their wealth. This study specifically examined stock ownership as a wealth building strategy by different personality types. It was hypothesized that an association exists between personality type scores and stock ownership as a financial asset and wealth building strategy.

The third study, Chapter Four, examined the relationship between personality and life satisfaction as mediated by money. Here, it was hypothesized that personality trait scores have both a direct effect on life satisfaction and an indirect effect on life satisfaction through money. This study used both income and net worth as proxies for money.

The potential impact of understanding the association between personality and the different dimensions of wealth building as expressed thru net worth in the three studies may be meaningful and noteworthy within the financial planning field for understanding how people may have a predisposition for achieving different wealth levels. Perhaps, saving motives may be a function of how people express their personalities creating preferences for different levels of savings and saving strategies, as well as, identifying potential blind spots that individuals may be overlooking.

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Chapter 2 - The Association between Personality and Net Worth

Introduction

Net worth is an important indicator in determining life satisfaction and happiness for individuals (Headey, Muffels, & Wooden, 2008). Academic literature has identified that net worth has both economic and non-economic functions for people. Whereas examples of economic functions would include things like economic security and consumption ability, non-economic functions would include using wealth to acquire prestige and satisfy social status objectives (Tang, 1992; Rose & Orr, 2007). Furthermore, net worth can also denote the availability of both present and future financial options that are accessible by people (Mitchell & Mickel, 1999). Additionally, non-economic functions can be achieved by wealth accumulation and net worth. For example, studies have found that people use representations of wealth to acquire prestige and satisfy social status objectives (Tang, 1992; Rose & Orr, 2007). Hence, due to the importance of net worth on various aspects of life satisfaction, past research has sought to understand what factors are associated with net worth development (Beverly, Sharraden, Cramer, Shank, Nam, & Zhan, 2008; Ozawa & Yeo, 2011).

The purpose of this study was to contribute to the understanding of what influences the net worth acquired by individuals by examining the association between personality traits and net worth accumulation. Personality traits play a crucial role in how people make decisions (Bensi, Giusberti, Nori, & Gambetti, 2010) and, therefore, may be related to net worth accumulation. The remainder of this chapter is organized as follows: (a) literature review, (b) theoretical framework, (c) methodology, (d) results, (e) discussion, and (f) conclusion.

Literature Review

Current academic literature has depended on intertemporal theories, demographic variables, and psychological disposition factors to determine estimates for net worth (Ozawa & Yeo, 2011). However, each of these areas has provided either incomplete or conflicting data regarding net worth estimation models. Additionally, personality traits have been identified by past research to influence decision making (Paunonen & Ashton, 2001; Paunonen, 2003) and may potentially provide useful insight for better understanding net worth determination.

Intertemporal Models

The three core intertemporal theories include John Keynes' absolute income hypothesis, Friedman's permanent income hypothesis, and Ando and Modiglinai's life cycle hypothesis (Bryant & Zick, 2006). Within each theory, a potential explanation is provided regarding how net worth is developed through a savings mechanism. According to the absolute income hypothesis, savings is based upon a percentage factor of income once income exceeds a baseline consumption level. Lower-income individuals save less of their income because they need it for consumption necessities. However, as income rises, consumption activities do not increase at the same rate and, as a result, a greater percentage of income can be saved. In both the permanent income hypothesis and life cycle hypothesis, savings and net worth accumulation are a function of smoothing consumption and providing individuals a continuous flow of income throughout their lifetimes. Accordingly, based upon these two frameworks, it would follow that net worth would be a function dependent on which life cycle period people are in at a specific point in time (Ozawa & Yeo, 2011). Specifically, initially when individuals enter the work force, earnings will be generally lower and, thus, savings and net worth accumulation will be slower. However, as people age and reach their peak earning years, net worth will reach a maximum point and begin

to decease in retirement. Under the life cycle hypothesis model, net worth would ideally decrease to zero at death. However, in the permanent income hypothesis, accommodations for inheritances are also considered; thus, savings can exist at death for the purposes of beneficiary bequests.

A comprehensive study was conducted by Dynan, Skinner, and Zeldes (2000) in regards to the predictable strength of intertemporal models for determining savings and net worth. The results of the study were mixed. Analyzing data from the Consumer Expenditure Survey, Survey of Consumer Finances, and the Panel Study of Income Dynamics, the researchers found a relationship between income and savings. Using five income categories, the study found saving rates increased with higher incomes. However, the study concluded that income and age could not be the only determining factors of net worth because the variance of saving rates within each income category was great even within the same age groups. In addition, the study also found that households continued to save even into retirement. In some cases, especially in higher income categories, there was no evidence of dissaving into retirement. These findings contradict the permanent income and life cycle models, which infer a degree of dissaving into retirement to maximize overall lifetime consumption. This lack of dissaving in retirement was also evident in a similar study by Hildebrand (2001).

A study by Fisher and Montalto (2011) did not fully support the Dynan et al.'s study (2000). Fisher and Montalto did not find a significant relationship between higher income level and saving likelihood. Interesting, both studies utilized the Survey of Consumer Finances. The Dynan et al. study used the data set as one of three data sources, while the Fisher and Montalto focused only on this data set. The main difference between the two studies was the time period and analysis variable identification. Dynan et al. used data from 1983 to 1989 and separated

income into five categories, while Fisher and Montalto used data from 2007 and separated income into two categories (low and high income groups).

Demographic Factors

Researchers have also looked further into demographic factors for their associations with net worth and savings. As noted by intertemporal models, income and age are important factors influencing net worth (Bryant & Zick, 2006). Other important demographic variables include marital status, gender, race, and education (Diaz-Gimenez, Quadrini, & Rios-Rull, 2002; Campbell & Kaufman, 2006; Ozawa & Yeo,2011; Ruel & Hauser, 2013).

Utilizing data from the Survey of Consumer Finance, married individuals exhibited higher net worth levels than single (Diaz-Gimenez, Quadrini, & Rios-Rull, 2002). An explanation for this observation, offered by Ozawa and Yeo (2011), is that married couples benefit from economies of scale in daily living expenses, such as housing and child care costs and thus, are able to save more to build their net worth. Similar findings were also reached by Ruel and Hauser (2013). Their reserach utilized a 50-year Wisconsin Longitudinal Study. This study found that married couples have higher net worth levels. In addition, marriage dissolution was found to adversely impact net worth. The study also found that single women households as having lower net worth levels than single men households. Women were identified to be more likely to earn less than their male counterparts as the reason for lower accumulated savings. Furthermore, the study noted that single households with children were more likely to be head by women than men, and the cost associated with raising children increased financial expenses and reduced savings.

Race has been another factor significant in its association with net worth even when controlling for other demographic variables. Using panel data from the Survey of Income and

Program Participation, Campbell and Kaufman (2006) found Whites as having higher net worth levels than all other races. Asian-Americans followed closely to Whites, with Mexican-Americans and other Hispanics substantially lower than Whites. Specifically, Mexican-Americans and other Hispanics' net worth were approximately only half of Whites. Black respondents represented the lowest net worth group in the study. This study is consistent with other research regarding race and net worth (Ozawa & Yeo, 2011). These findings may be related to risk tolerance (Ozawa & Yeo, 2011). Ozawa and Yeo noted that Blacks were the most risk adverse, followed by Hispanics and Asian-Americans while Whites were more risk tolerant. One potential result of being more risk tolerant is allocating portions of net worth to higher risk and return holdings, which potentially results in higher net worth levels over time.

Education also plays an important role in determining net worth (Ozawa & Yeo, 2011). Higher education levels impact net worth on two levels. First, higher education is generally associated with high income earning ability, which influences net worth accumulation (Diaz-Gimenez, Quadrini, & Rios-Rull, 2002). Second, education is associated with higher financial management ability (Ozawa & Yeo, 2011).

Psychological Variables

Academic research has acknowledged that demographic characteristics alone are not sufficient for determining wealth because people with similar demographic characteristics accumulate radically different net worth levels (Ameriks, Caplin, & Leahy, 2003). To address this, studies have attempted to incorporate psychological factors into understanding savings behavior and net worth outcomes (Ameriks, Caplin, & Leahy. 2003; Gutter, Hayhoe, & Wang, 2007; Gutter, Hayhoe, DeVaney, Jinhee, Bowen, Cheany, Cho, Evans, Gorham, Lown, Mauldin, Solheim, Worthy, Dorman, 2012). However, research in the area is difficult and results have

been mixed. A major constraint in studying psychological factors' effects on net worth has been the limited amount of psychological data in large scale secondary data sets that focus on financial and economic research (Ameriks, Caplin, & Leahy. 2003). Furthermore, significant findings related to the limited number of psychological variables that do exist in these data sets have not been overly successful.

Gutter, Hayhoe, and Wang (2007) utilized data from the Survey of Consumer Finance to research psychological related variables. Their study found risk tolerance as a significant factor influencing savings, but analysis regarding self-control was not significant. This finding was in contrast to the Thaler and Benartzi (2004) study on qualified retirement plan participation that identified will-power as an important contributing factor for retirement savings.

A comprehensive study focusing on the relationship between psychological elements and financial outcomes was undertaken by Gutter et al. (2012). Faculty from eleven universities participated in designing the study and a private sampling firm was hired to collect the data. There were 1,000 respondents in this survey, ranging between the ages of 24 and 66 years old. A total of ten psychological variables were tested to see if they were significant factors in having a savings or investment account for accumulation (i.e., self-efficacy, risk tolerance, impulsivity, materialism, distrust, anxiety, planning horizon, percieved barriers, if others say to save, and approval from others to save). The results yielded limited significant findings regarding the psychological variables that were tested. Of the ten variables, only two (i.e., planning horizon and percieved barriers) were significant.

Cognitive biases represents another approaches used in past research to incorporate psychological elements to explain savings behavior (Sherfin & Thaler, 1988). Under a behavioral life cycle hypotheses framework, individuals have different propensity to save levels for

different buckets of money. In other words, people use mental accounting to separate accounts for different types of saving objectives, and the will power to save for or spend from each account varies. Support for this approach was provided by Levin (1998) who examined household data from the Longitudinal Retirement History Survey. In his research, he separated household assets into four different categories and found households more likely to utilize money from one preferred category compared to other categories. However, a glaring limitation of the findings in this study was that not all categories had the same amount of liquidity access (i.e., property assets compared to cash assets). Another possible explaination for perferred fund access may have been due to liquidity constraints rather than behavioral preferences. A smaller study by Graham and Isaac (2002) looked at savings behavior of university instructors and found evidence for behavioral life cycle hypotheses. Additional income obtained from summer school teaching was treated differently from base annual salaries. Summer school income was more likely to be allocated toward savings than regular living expenses. However, the small sample size was a limitation of this study.

Researchers have attempted to improve net worth accumulation models by adding psychological variables to better identify people who have a propensity to save and to better understand the factors involved with developing people's net worth (Ameriks, Caplin, & Leahy, 2003). Thus far, this effort has been met with limited success. The goal of this study was to improve the understanding regarding how a set of psychological variables, specifically personality traits, influences net worth.

Theoretical Overview

The theoretical framework that guided this study was psychological type theory. This theory explains what appears to be random variations in behavior as the result of differences in people's mental functions and attitudes that are expressed by their personalities (Wicklein & Rojewski, 1995). Essentially, psychological type theory is a preference theory of how personality traits influence people's perceptions, the direction of people's focus, and how information is mentally processed (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). The theory, as depicted in Figure 2.1, infers that people's focus orientation and mental functions create mental and behavioral preferences variations (Jung, 1971). Preference variations create diversification to improve the survivability of the human species as part of an evolutionary process (Tooby & Cosmides, 1990; McAdams & Pals, 2006; Nettle, 2007).

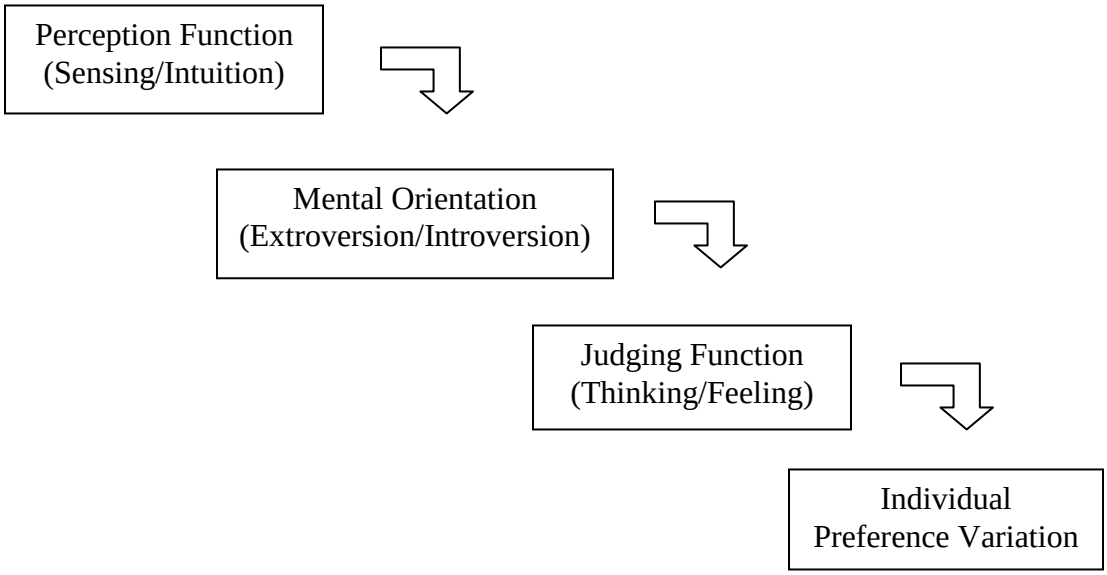

Figure 2.1. Psychology type theory

In the theory, people focus their mental energy along an inward or outward preference spectrum (Jung, 1971). The personality term of introvert is used to describe when attitudes are focused inward and the personality term of extrovert is used to describe when attitudes are focused outward. The theory also describes two mental preference functions that exist within people's personalities (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). One set of mental functions are used to describe how individuals accept information. According to type theory, people accept information along a sensing/intuition preference spectrum. Sensing refers to utilizing the five senses to process information, while intuition focuses on meaning, associations, and relationships. The other set of mental functions are used to describe how individuals make decisions. Type theory also conveys that people make decisions along a thinking/feeling preference spectrum. At the thinking end of the spectrum, decisions are made based upon impersonal and objective logic while, at the feeling end, decisions are made with a person-centered and values-based approach.

According to type theory, interaction exists between the preference dimensions (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Specifically, where mental energy is directed interacts with the two set of mental functions. That is to say that the introvert/extrovert preference spectrum interacts with both the sensing/intuition dimension and the thinking/feeling dimension. Furthermore, interaction also exists between the two mental functions themselves (i.e., the sensing/intuition dimension interacts with the thinking/feeling dimension).

Additionally, some individuals favor processing information and have a predisposition for information gathering (perception function), while others prefer getting to a point of decisive decision making (judging function). As a result, a fourth dimension called the perceiving/judging preference also exists (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). In this personality

orientation, individuals who favor seeking additional information are categorized as perceivers and those individuals who favor decisive decisions are categorized as judgers.

Psychological type theory is often used with dichotomous variables to represent the personality type variables (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). The rational for using dichotomous representation is to provide a discrete categorical score to reflect an underlying preference (Salter, Forney, & Evans, 2005). However, some researchers prefer a continuous scoring method to gauge the extent or strength of a particular preference (McCrae & Costa, Jr., 1989, 2006, 2008; Arnau, Green, Rosen, Gleaves, & Melancon, 2003; Salter, Forney, & Evans, 2005).

McCrae and Costa (1989; 2006) proposed The Big Five personality model, which provides continuous dimensions for personality traits as an alternative framework to operational psychological type theory. The Big Five consists of five personality traits, which include extroversion, conscientiousness, openness, agreeableness, and neuroticism. As identified in Table 2.1, various studies have found a positive relationship between the psychological personality types and The Big Five traits (Furnham, Moutafi, & Crump, 2003; McCrae & Costa, 1989, 2006). Essentially, these studies have identified The Big Five's extroversion scale to match psychological type theory's extrovert/introvert spectrum, conscientiousness to match the perceiving/judging spectrum (higher conscientiousness levels was associated with higher judging scores), openness to match sensing/intuition spectrum (higher openness levels was associated with higher intuition scores), agreeableness to match thinking/feeling spectrum (higher agreeableness was associated with higher feeling scores), and neuroticism was associated with both the extrovert/introvert and thinking/feeling spectrums (McCrae & Costa, Jr., 1986, 2006; Furnham, Moutafi, & Crump, 2003; Furnham, Moutafi, & Paltiel, 2005; Furnham, Dissou,

Sloan, & Chamorro-Premuzie, 2007). Specifically, neuroticism was associated with higher introvert and lower thinking levels (Furnham, Jackson, Fordes, & Cotter, 2001; Ragossino & Kelly, 2011). The study in this chapter used The Big Five trait variables to represent psychological type for measurement purposes.

Table 2.1

Corresponding Big Five traits and Psychological Personality Types

Big Five Continuous Trait	Psychological Type Domains
Extroversion	Preference for the extroversion domain (outward focus and attention) over the introversion domain (internally focused)
Conscientiousness	Preference for the judging domain (decision making) over the perceiving domain (data gathering)
Openness	Preference for the intuition domain (imagination, creativity, and symbolism) over and the sensing domain (observable, concrete, and realistic)
Agreeableness	Preference for the feeling domain (accommodating, empathetic, and compassionate) over the thinking domain (logically, critical, and reasonable)
Neuroticism	Combination of preferences for a higher introversion domain (internally focused) and a lower thinking domain (logically, critical, and reasonable).

Associations between Personality and Financial Behavior

Past studies have examined the relationship between personality and various types of behavior (Paunonen & Ashton, 2001). For example, studies have identified personality to be associated with school performance (Lievens, Dilchert, & Ones, 2009), health related choices (Bogg, Voss, Wood, & Roberts, 2008), work performance (Caplan, 2003), and occupation decisions (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). However, available research examining the relationship between personality and financial behavior has been limited (Nyhus & Webley, 2001; Boyce & Wood, 2011; Harrison & Chudry, 2011).

Essentially, available research regarding the association between personality and financial behavior has been contained to the areas of risk tolerance, spending/saving behaviors, and income earning outcomes. In regards to risk tolerence, three MBTI® (i.e., Myers Briggs Type Indicator surveys) studies were conducted; two in the United States; and one in China. The United States studies included one that involved 68 university participants (Filbeck, Hatfield, & Horvath, 2009), and another study that surveyed 100 investors (Pompian & Longo, 2004). The Chinese study surveyed 200 undergraduate students (Li & Liu, 2008). All three studies were consistent with each other in reporting a perference for extroversion and percieving as being assoicated with higher risk tolerence levels. The two American studies further found the thinking perference within MBTI® as being associated with higher risk tolerence.

The extroversion/introversion and the perceiving/judging dimensions were additionally found to be associated with spending and saving behaviors. In the Big Five personality framework, the extroversion/introversion dimension is simply represented by the extroversion trait and the perceiving/judging dimension is represented by the consciousness trait (higher consciousness scores represent higher judging preference levels and lower perceiving preference

levels). A Norwegian study of 144 individuals found impluse buying to be positively correlated to individuals' extroversion levels and negatively correlated to their conscienousness scores (Verplanken & Herabadi, 2001). Nyhus and Webley (2001) were partially able to match these results. Their study of 2,800 households in the Netherlands found that higher extroverion scores were associated with less savings. They were unable to find any relationship between the conscientiousness trait and savings; however, the agreeableness trait (the thinking/feeling dimension in type theory) was found to be inversely related to saving behavior. A later study by Duckworth and Weir (2010; 2011) did find conscienousness to be positively correlated to savings and lifetime earnings while higher levels neuroticism decreased lifetime earnings in their analysis of the U.S. Health and Retirement Survey data set.

In the area of labor income earnings by individuals, past studies have found an association between personality and income (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Sutin, Costa, Miech, & Eaton, 2009; Viinikainen, Kokko, Pulkkinen, & Pehkonen, 2010). Viinikainen et al. (2010) found that the extroverion, openness, and conscientiousness traits were associated with higher incomes and higher earning professions, while the neuroticism trait was identified as being negitively associated with income. A potential explanation for this relationship identified by Sutin et al. (2009) was that the extroversion and conscientiousness traits were also associated with higher levels of career success, which was rewarded with high incomes for individuals, while the neuroticism trait was negatively related to career success. Sutin et al. also identified the openness trait as being related to prestige variables, which was related to higher incomes.

Type theory infers personality is associated with variations in economic outcomes due to variations in preferences, and the studies demostrate that personality and variations in financial

decision making are related. One purpose of this paper was to extend the work in this area by specifically examining the association between personality types and net worth. The following hypotheses were examined within this research:

Hypothesis 1: The extroversion trait is positively associated with individual net worth.

Hypothesis 2: The openness trait is positively associated with individual net worth.

Hypothesis 3: The agreeableness trait is positively associated with individual net worth.

Hypothesis 4: The conscientiousness trait is positively associated with individual net worth.

Hypothesis 5: The neuroticism trait is negatively associated with individual net worth.

Type theory infers an association between personality and net worth, but it does not reason the direction of association between personality and net worth. However, past research literature previously discussed regarding the influence of personality with saving, spending, and income does provide some guidance in regards to the direction of the personality/net worth relationship. The extroversion, openness, and agreeable traits are all associated with higher incomes in past research indicating a positive relationship between these traits and net worth (Viinikainen, Kokko, Pulkkinen, & Pehkonen, 2010). Neuroticism is negatively related to income based upon past research implying a negative association with net worth (Duckworth and Weir, 2010).

Past research regarding spending and saving behavior scores would support a positive association between the conscientiousness trait and higher net worth levels (Duckworth & Weir, 2010; 2011), while higher scores in extroversion and agreeableness would be associated with lower levels of net worth (Nyhus & Webley,2001; Verplanken & Herabadi, 2001). However, the higher spending behavior by those with higher extroversion scores may be off set with their positive association with higher incomes.

In addition to the individual dimensions, psychological type theory also states that specific dimensions interact with one another to influence behavior (Jung, 1971; Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Specifically, the introversion/extroversion dimension (i.e., measured by the extroversion trait) conveys where mental energy is directed interacts with how information is obtained through the sensing/intuition dimension (i.e., measured by the openness trait) and how decisions are made through the thinking/feeling dimension (i.e., measured by the agreeableness trait). Furthermore, the sensing/intuition dimension and thinking/feeling dimension also interacts with each other. As a result, the following additional questions were also explored:

Exploratory question 1: What is the association between the interaction of extroversion and openness with individual net worth?

Exploratory question 2: What is the association between the interaction of extroversion and agreeableness with individual net worth?

Exploratory question 3: What is the association between the interaction of openness and agreeableness with individual net worth?

As with individual personality expressions, type theory infers an association between personality interaction and net worth, but the theory does not reason the direction of association.

Unlike individual personality traits, the research regarding trait interaction is limited. The analysis for these three questions was exploratory in nature because of the current lack of research that exists regarding the how personality type interaction affects net worth.

Methodology

Data and Sample

This study utilized data from the 2010 Health and Retirement Study (HRS). The HRS dataset is a national, longitudinal survey conducted by the Survey Research Center at the University of Michigan. The survey is funded by the National Institute on Aging and the Social Security Administration. HRS collects information to provide multidisciplinary data for researchers to help address the challenges and opportunities of aging. The objective of data collection by HRS is to (a) explain the antecedents and consequences of retirement; (b) examine health, income, and wealth relationships over time; (c) examine life cycle wealth accumulation and consumption patterns; (d) monitor disability from work; and (e) examine how economics, family, and program resources affect retirement, dis-savings, health declines, and institutionalizations (National Institutes of Health, 2007).

HRS data collection initially began in 1990 and has been conducted on a biennial basis. The HRS survey interviews household participants over the age of 50 from the contiguous United States. Households are selected to provide a nationally representative sample of older Americans under a four-stage complex sampling design process. The first stage involves proportionate probability selection of primary stage sampling units from U.S. Metropolitan Statistical Areas (MSA's) and non-MSA counties. The second stage identifies sampling area segments within the primary stage sampling units. The third stage locates all housing units in the

sampling area segments, and the fourth stage is the selection of potential household financial unit respondents within the housing unit. The HRS dataset does purposely include three oversamples. The oversamples include Black respondents, Hispanic respondents, and Florida state residents. The HRS dataset provides sampling weights to compensate for the oversampling of these three groups (Heeringa & Connor, 1995).

Respondents were interviewed face to face. If a face-to-face meeting was not possible or convenient, then the interview was completed via telephone. In addition, interviewers attempted to obtain information from proxy informants when individual respondents were unable to complete an interview due to either physical or cognitive limitations (Health and Retirement Study Sample Evolution: 1992-1998, n.d.). Potential proxy informants included spouses, children, and other household members. Proxy informants were also utilized to provide information regarding respondents after their deaths. Starting in 2006, for those respondents interviewed face-to-face, a self-administered questionnaire containing personality questions was left with respondents upon the completion of the in-person interview. Upon completion of the self-administered questionnaire, responses were mailed back to the survey center at the University of Michigan (Institute for Social Research, 2008). The personality questions in this questionnaire were designed to be used as item components for creating five scales to measures the personality traits that exist in The Big Five framework. In 2010, the personality questions were slightly revised with additional item questions to increase the coverage of personality traits (Smith, Fisher, Ryan, Clarke, House, & Weir, 2013). The personality data from the 2010 Psychosocial Lifestyle Questionnaire was used in this dissertation study, in addition to the data from the main HRS survey.

This study utilized the 2010 RAND data file version of the HRS survey as well as 2010 panel data from the Psychosocial Lifestyle Questionnaire survey. The RAND dataset is a cleaned, processed, and streamlined variable collection of HRS data (RAND Center for the Study of Aging, 2011). A key advantage of the RAND data file is that it provides for consistent definitions of household income and wealth data through all survey years. However, the RAND version does not include any personality variable data. This data is found in the Psychosocial Lifestyle Questionnaire. For the purposes of this dissertation research, data from the Psychosocial Lifestyle Questionnaire was merged with the RAND dataset for analysis.

Each household in the HRS data set contained one individual who was identified as the financial respondent and who was responsible for answering financial questions (RAND Center for the Study of Aging, 2011). This study selected only the financial respondents to be included for analysis purposes. The Psychosocial Lifestyle Questionnaire was provided to 50% of the respondents that were randomly selected after core HRS data was collected (Smith, Fisher, Ryan, Clarke, House, & Weir, 2013). The Psychosocial Lifestyle Questionnaire is a paper survey that respondents were asked to complete and return by mail. The number of financial respondents who completed this written questionnaire in 2010 was 5,402. The total size of the sample population used in this study was 5,084, which represented financial respondents who had completed the demographic and personality traits questions sufficiently to be included in this analysis. Based upon complex sampling procedures, the 5,084 respondents when weighted were designed to represent a total of 23,543,185 individuals.

Variables

The dependent variable in this research was net worth. The independent variables of interest for this study were personality types (Table 2.2), which were measured using personality

trait scale scores. McCrae and Costa (1989; 2006) proposed using The Big Five personality traits as potential measurement variables to represent psychological personality type. In the HRS survey, respondents were asked to rate 31 words from one to four based upon how well the words described themselves. Each word was an adjective associated with one of The Big Five personality traits. The trait score for extroversion was calculated by averaging the responses represented by five adjectives (outgoing, friendly, lively, active, and talkative). The agreeableness trait was also calculated by averaging the responses of five adjectives (i.e., helpful, warm, caring, softhearted, and sympathetic). Conscientiousness used the average of seven adjectives (i.e., organized, responsible, hardworking, self-disciplined, cautious, thorough, and thrifty) with three additional reverse-coded words (i.e., reckless, careless, and impulsive). Openness used the average of seven adjectives (creative, imaginative, intelligent, curious, broad-minded, sophisticated, and adventurous). Neuroticism average the responses of three adjectives (i.e., moody, worrying, and nervous), and one additional reverse-coded adjective response (i.e., calm). Scores were calculated as long as least half of the adjectives representing each personality trait were answered. The Cronbach's alpha scores were .75 for extroversion, .79 for agreeableness, .68 for conscientiousness, .80 for openness, and .71 for neuroticism. Cronbach's alpha is used to measure scale reliability with preferred scores at .70 or higher. Scores slightly below .70 are generally deemed acceptable (Field, 2013).

Table 2.2

Measurement of Individual Personality Trait Variables

Variables	Measurement

Variables	Measurement
Extroversion	Scale between 1 to 4 (the higher the number, the stronger the trait)
Conscientiousness	Scale between 1 to 4 (the higher the number, the stronger the trait)
Openness	Scale between 1 to 4 (the higher the number, the stronger the trait)
Agreeableness	Scale between 1 to 4 (the higher the number, the stronger the trait)
Neuroticism	Scale between 1 to 4 (the higher the number, the stronger the trait)

Low and high extroversion, openness, and agreeableness categories were created by separating trait scores by their medium. If a score was calculated below the median, then the score was coded as low. Likewise, if a score was calculated above the median, then the score was coded as high. This was done to create categories for the interaction of personality types which are identified under psychology type theory. Specifically, extroversion interacts with both the openness and agreeableness traits, while openness and agreeableness interact between each other (Jung, 1971; Briggs Myers, McCaulley, Quenk, & Hammer, 2009). The coding method to show the interaction relationship is displayed in Table 2.3.

Table 2.3

Coding of Interacting Personality Trait Variables

Variables	Coding
Extroversion and Openness Combination	Continuous, product of extroversion times openness trait scores
Extroversion and Agreeableness Combination	Continuous, product of extroversion times

Variables	Coding
	agreeableness trait scores
Openness and Agreeableness Combination	Continuous, product of openness times agreeableness trait scores

Age, gender, income, net worth, education level, race, and marital status represented control variables that were previously identified in past research literature associated with net worth. Table 2.4 identifies the measurement units for the remaining variables in this study.

Table 2.4

Measurement of Dependent and Control Variables

Variables	Measurement
Dependent Variable	
Log net worth	Continuous (net worth values were provided by the Rand data set), one was added to zero and positive net worth values then logged
Independent Variables	
Gender and marital status	
Single male	1 for single male; 2 otherwise
Single female	1 for single female; 2 otherwise
Married male	1 for married male; 2 otherwise
Married female	1 for married female; 2 otherwise

Variables	Measurement
Age	
50-59	1 if respondent reported age between 50 to 59; 2 otherwise
60-69	1 if respondent reported age between 60 to 69; 2 otherwise
70-79	1 if respondent reported age between 70 to 79; 2 otherwise
80 plus	1 if respondent reported age between 80 or above; 2 otherwise
Hispanic	
Hispanic	1 if respondent reported as Hispanic; 2 otherwise
Race	
White	1 if respondent reported as White; 2 otherwise
Black	1 if respondent reported as Black; 2 otherwise
Other	1 if respondent reported as other; 2 otherwise (Note: RAND dataset does not differentiate for Asian because HRS collected this category differently for different years)
Education	
Less than high school	1 if respondent reported highest level of education as less than high school diploma or GED; 2 otherwise
High school or GED	1 if respondent reported highest level of education as either high school diploma or GED; 2 otherwise
College graduate	1 if respondent reported highest level of education as college grad; 2 otherwise

Variables	Measurement
Bachelor's degree	1 if respondent reported highest level of education as bachelor's degree; 2 otherwise
Post-graduate degree	1 if respondent reported highest level of education as a post-graduate degree; 2 otherwise
Log household income	Continuous, one was added to zero and positive household income then logged

Empirical Model

The general model utilized in this research to establish the association of personality with net worth was the linear regression model below:

$$Y=b_0 + b_1 \text{ demographic variable } 1 + b_2 \text{ demographic variable } 2 \ldots + b_n \text{ demographic variable } n + b_1 \text{ demographic variable } 1 + b_{n+1} \text{ personality type} + \varepsilon$$

In this model, a best fit line describing the relationship between the dependent variable and identified independent variable(s) is created. The value of the dependent variable is represented by Y, and the Y intercept is represented by b_0. The variables b_1 to b_n are unstandardized regression coefficients for their respective independent demographic control variables. The variable b_{n+1} is the unstandardized regression coefficient for the independent personality variable. These regression coefficients identify the change in outcome associated with a unit change of a specific independent variable. The term ε represents the residual value

indicating the difference between the value predicted by the model and the actual value of the independent variable.

Demographic variables previously identified by literature as affecting net worth served as control variables in this model. In addition, personality variables were also used as independent variables. The expected relationships between the independent variables and the dependent variable based upon existing literature are identified in Table 2.5.

Table 2.5

Expected Relationship between Independent Variables and Dependent Variable (Net Worth)

Control Variable	Effect on Dependent Variable (net worth)
Gender (male)	+
Age	-
Hispanic	-
Race (White)	+
Race (Black)	-
Race (Other)	Unknown
Education	+
Marital status (married)	+
Household income	-
Extroversion	+
Conscientiousness	+
Openness	+

Control Variable	Effect on Dependent Variable (net worth)
Agreeableness	-
Neuroticism	-
Extroversion/openness	Unknown
Extroversion/agreeableness	Unknown
Openness/agreeableness	Unknown

Statistical Analysis

The complex samples regression analysis was used to account for the complex sampling design of the HRS data set. Complex sampling procedures weigh observation values differently based upon data stratification from no-overlapping segments, data clustering from similar segments, and weight functions due to unequal selection probabilities (Aneshensel, 2013). To account for the complex sampling design of the data set, data variable weights were provided by HRS. The variable RAESTRAT was used for the stratification weight, the variable RAEHSAMP was used for cluster weight, and the variable MWGTR was used to adjust the sample selection weight to account for only 50% of the HRS 2010 panel as being randomly selected to answer the Psychosocial Lifestyle Questionnaire (Smith, Fisher, Ryan, Clarke, House, & Weir, 2013). Data sets that use complex sample designs should also use complex sample analysis procedures (Heeringa & Connor, 1995; National Institutes of Health, 2007; Neilsen, Davern, Jones Jr., & Boies, 2009; Aneshensel, 2013; Nielsen & Seay, 2014). Failure to use complex sample analysis procedures may increase the probability of Type I errors, concluding relationships exist when in reality they do not exist. Complex sample analysis yields parameter estimates and calculates standard error values.

Separated regression models were created in this study to evaluate the association between personality and net worth. In the first regression model, the initial block of independent variables inputted was demographic control variables. Essentially, the first block represents the empirical model with only the control variables. In the second model, personality variables were entered as additional independent variables.

Three additional models were added to account for the interaction of personality variables. These included models to test the extroversion and openness, extroversion and agreeableness, and the openness and agreeableness interactions. These models were completed separately to avoid autocorrelation between the personality variables. For example, the extroversion/openness interaction variables would be highly correlated to the extroversion/agreeableness interaction variables because all the interaction variables have the same extroversion score component. The R^2 values of each block were examined, and t-statistics for each independent variable were reviewed.

Results

Descriptive Statistics

Results from the descriptive statistics are contained in Table 2.6. A total of 5,084 survey respondents were included in this study. Mean log household net worth and log household income were $114,025 and $39,573 respectively. In regards to gender and marital status, single males represented 15.10% of the study, single females represented 31.08%, married males represented 33.38%, and married females represented 20.43%. Mean net worth levels of married respondents were noticeable higher. For example, married males had a mean net worth of $280,285 compared to the mean net worth of single males, which was only $47,206. Married

females also had a noticeable higher mean net worth (i.e., $187,932) when compared to the mean net worth of single females (i.e., $47,698).

As far as age category, 32.59% were between ages 50 and 59, 33.26% were between age 60 and 69, 20.17% were between 70 and 79, and 13.97% were 80 and above. Mean net worth was $83,291 for those between 50 and 59. In the 60 to 69 age category, mean net worth was $125,487. In the 70 to 79 age category mean net worth was $157,652 and decreased to $116,842 for those ages 80 and above.

Hispanics represented 6.20% of the sample's ethnicity. Most respondents registered as Whites (88.24%), followed by Blacks (8.73%), and other races represented the remaining of the sample (3.02%). Hispanics and Blacks had the lowest mean net worth of $9,779 and $7,201 respectively. Whites had the highest mean net worth of $155,561. Mean net worth for other races was $36,526.

Most respondents had a GED or high school diploma (53.74%). Those who had not attained at least a GED or high school diploma represented 10.81% of the sample. Respondents who at least attended college (6.16%), graduated from college (17.01%), or achieved a post-graduate degree (12.29%) represented the remainder of the education category variable. Net worth increased with education. Mean net worth changed from $9,099, representing those without a high school diploma, to $96,228 for those whose highest level education was a high school diploma. Net worth increased to $128,884 for individuals with some college experience and further increased to $362,660 for college graduates. Mean net worth for post-graduate degree respondents was $414,954.

The independent variables of interest in this study were measured by personality traits on a scale from 1 to 4. Lower numbers represented lower trait levels, and higher numbers

represented higher trait levels. The agreeableness trait was the most dominant trait with a sample mean of 3.48. The next highest trait, with a sample mean of 3.27, was conscientiousness. This trait was followed by the extroversion trait, which had a sample mean of 3.16. The openness trait was recorded at a mean of 2.95, and neuroticism was recorded at 2.01.

Table 2.6

Descriptive Statistics

Variable	Mean or Percent	Weighted Mean Log Net Worth (Dollars)
Log net worth		5.0570 ($114,025)
Single male	15.10%	4.6740 ($47,206)
Single female	31.08%	4.6785 ($47,698)
Married male	33.38%	5.4476 ($280,285)
Married female	20.43%	5.2740 ($187,932)
Age category		
Age 50-59	32.59%	4.9206 ($83,291)
Age 60-69	33.26%	5.0986 ($125,487)
Age 70-79	20.17%	5.1977 ($157,652)
Age 80 plus	13.97%	5.0676 ($116,842)
Hispanic ethnicity	6.20%	3.9903 ($9,779)
White race	88.24%	5.1919 ($155,561)
Black race	8.73%	3.8574 ($7,201)

Variable	Mean or Percent	Weighted Mean Log Net Worth (Dollars)
Other race	3.02%	4.5626 ($36,526)
Education category		
Less than high school	10.81%	3.9590 ($9,099)
High school or GED	53.74%	4.9833 ($96,228)
Some college	6.16%	5.1102 ($128,884)
College graduate	17.01%	5.5595 ($362,660)
Post-graduate degree	12.29%	5.6180 ($414,954)
Log household income		4.5974 ($39,573)
Extroversion	3.1583 (i.e., scale between 1 to 4)	
Conscientiousness	3.2698 (i.e., scale between 1 to 4)	
Openness	2.9479 (i.e., scale between 1 to 4)	
Agreeableness	3.4776 (i.e., scale between 1 to 4)	
Neuroticism	2.0068 (i.e., scale between 1 to 4)	

N = 5.084

Regression Analysis Results

Results of the initial regression model using only demographic variables and a second model applying both demographic and personality variables are shown in Table 2.7. Consistent with previously cited research, gender, marital status, age, ethnicity, race, education level, and household income were significantly associated with household net worth at the $p < .001$ level. The analysis found both married females and males as being significantly associated with higher net worth values, controlling for all other variables, when using single males as a reference group. In addition, controlling for all other variables, age appears to be positively associated with net worth. Higher age categories were accompanied with higher positive coefficient scores in this analysis. Using Whites as a reference category for race, Blacks and other races had significant negative coefficient scores controlling for all other variables. The Hispanic category also had a significant negative coefficient score conveying lower net worth levels for this category, (i.e. when using Non-Hispanics as a reference category for ethnicity controlling for all other variables). Finally, using no GED and no high school graduation as a reference category, all other higher education categories were identified as significantly associated to higher net worth values, holding all else equal.

The addition of personality traits increased the R^2 from 33.8% in model one to 35.1% in model two. Three personality traits were identified as being significantly associated to net worth at the $p < .01$ level, holding all else equal. Extroversion and conscientiousness were positively associated with higher levels of net worth, while agreeableness was negatively associated with net worth. These findings are consistent with what was previously expected in the previous section (See Table 2.5) based upon past academic literature.

Table 2.7

Linear Regression Results - Demographic and Personality Variables Contributing to Net Worth

	Model 1			Model 2		
Variable	*B*	*SE B*	Sig.	*B*	*SE B*	Sig.
Single male (reference group)						
Single female =1, else 2	0.004	0.075	.954	-0.011	0.069	.869
Married male = 1, else 2	0.380	0.060	.000**	0.358	0.059	.000**
Married female = 1, else 2	0.388	0.064	.000**	0.366	0.061	.000**
Age 50 to 59 (reference group)						
Age 60 to 69	0.231	0.045	.000**	0.218	0.045	.000**
Age 70 to 79	0.402	0.054	.000**	0.373	0.053	.000**
Age 80 plus	0.458	0.054	.000**	0.449	0.056	.000**
Hispanic ethnic = 1, else 2	-0.676	0.124	.000**	-0.684	0.120	.000**
White (reference group)						
Black = 1, else 2	-0.862	0.090	.000**	-0.883	0.089	.000**
Other race = 1, else 2	-0.119	0.118	.000**	-0.102	0.121	.402
No GED/high school (reference group)						
GED/high school = 1, else 2	0.633	0.084	.000**	0.614	0.082	.000**
Some college = 1, else 2	0.767	0.090	.000**	0.728	0.090	.000**
College graduate = 1, else 2	1.033	0.084	.000**	0.973	0.081	.000**
Post graduate =1, else 2	0.998	0.095	.000**	0.932	0.092	.000**
Log household income	0.439	0.047	.000**	0.424	0.045	.000**

	Model 1			Model 2		
Variable	*B*	*SE B*	Sig.	*B*	*SE B*	Sig.
Extroversion				0.129	0.046	.007**
Agreeableness				-0.158	0.050	.002**
Conscientiousness				0.274	0.051	.000**
Openness				0.030	0.050	.592
Neuroticism				-0.053	0.033	.112
R^2		.338			.351	
Wald F		83.806**			62.457**	

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

Interaction Regression Analysis Results

Results from regression analysis incorporating the interaction of personality trait variables are shown in Tables 2.8, 2.9 and 2.10. The interaction of extroversion and openness, as shown in Table 2.8, showed a significant association between these types of interactions and net worth. However, the R^2 score for this model was only .350 which was lower than the R^2 score of .351 in model two, as seen in Table 2.7, which incorporated only individual personality traits without any interaction effect. It appears maintaining personality traits as individual traits rather than interaction variables provide a slightly better fit model. The remaining two interaction combinations of extroversion with agreeableness and openness with agreeableness, as shown in Table 2.9 and 2.10 respectively, showed no signification associations to net worth.

Table 2.8

Linear Regression Results - Interaction of Extroversion and Openness Contributing to Net Worth

Variable	Model 3		
	B	*SE B*	Sig.
Single male (reference group)			
Single female =1, else 2	-0.007	0.069	.920
Married male = 1, else 2	0.357	0.059	.000**
Married female = 1, else 2	0.367	0.061	.000**
Age 50 to 59 (reference group)			
Age 60 to 69	0.218	0.045	.000**
Age 70 to 79	0.372	0.053	000**
Age 80 plus	0.448	0.056	.000**
Hispanic ethnic = 1, else 2	-0.688	0.121	.000**
White (reference group)			
Black = 1, else 2	-0.889	0.089	.000**
Other race = 1, else 2	-0.097	0.122	.432
No GED/high school (reference group)			
GED/high school = 1, else 2	0.608	0.082	.000**
Some college = 1, else 2	0.717	0.090	.000**
College graduate = 1, else 2	0.965	0.081	.000**
Post graduate =1, else 2	0.926	0.092	.000**
Log household income	0.425	0.045	.000**

Variable	Model 3		
	B	*SE B*	Sig.
Extroversion	0.142	0.063	.028*
Agreeableness	-0.162	0.051	.002**
Conscientiousness	0.274	0.051	.000**
Openness	0.119	0.069	.089
Neuroticism	-0.052	0.033	.114
Personality interaction			
Extroversion X Openness	0.024	0.010	.017*
R^2	.350		
Wald F	66.415**		

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

Table 2.9

Linear Regression Results - Interaction of Extroversion and Agreeableness Contributing to Net Worth

Variable	Model 4		
	B	*SE B*	Sig.
Single male (reference group)			
Single female =1, else 2	-0.009	0.068	.892
Married male = 1, else 2	0.358	0.059	.000**
Married female = 1, else 2	0.366	0.059	.000**
Age 50 to 59 (reference group)			
Age 60 to 69	0.217	0.046	.000**
Age 70 to 79	0.368	0.053	.000**
Age 80 plus	0.444	0.056	.000**
Hispanic ethnic = 1, else 2	-0.689	0.120	.000**
White (reference group)			
Black = 1, else 2	-0.883	0.091	.000**
Other race = 1, else 2	-0.104	0.120	.388
No GED/high school (reference group)			
GED/high School = 1, else 2	0.615	0.082	.000**
Some college = 1, else 2	0.729	0.090	.000**
College graduate = 1, else 2	0.978	0.081	.000**
Post graduate =1, else 2	0.931	0.092	.000**

Variable	Model 4		
	B	*SE B*	Sig.
Log household income	0.425	0.045	.000**
Extroversion	0.146	0.063	.024*
Agreeableness	-0.104	0.065	.116
Conscientiousness	0.270	0.052	.000**
Openness	0.027	0.050	.597
Neuroticism	-0.053	0.032	.101
Personality interaction			
Extroversion X Agreeableness	0.000	0.007	.971
R^2	.348		
Wald F	66.501**		

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

Table 2.10

Linear Regression Results - Interaction of Openness and Agreeableness Contributing to Net Worth

	Model 5		
Variable	*B*	*SE B*	Sig.
Single male (reference group)			
Single female =1, else 2	-0.006	0.069	.932
Married male = 1, else 2	0.358	0.059	.000**
Married female = 1, else 2	0.368	0.061	.000**
Age 50 to 59 (reference group)			
Age 60 to 69	0.217	0.045	.000**
Age 70 to 79	0.370	0.052	.000**
Age 80 plus	0.446	0.056	.000**
Hispanic ethnic = 1, else 2	-0.690	0.120	.000**
White (reference group)			
Black = 1, else 2	-0.885	0.089	.000**
Other race = 1, else 2	-0.099	0.122	.422
No GED/high school (reference group)			
GED/high school = 1, else 2	0.608	0.083	.000**
Some college = 1, else 2	0.716	0.090	.000**
College graduate = 1, else 2	0.965	0.082	.000**
Post graduate =1, else 2	0.927	0.092	.000**

	Model 5		
Variable	*B*	*SE B*	Sig.
Log household income	0.425	0.044	.000**
Extroversion	0.133	0.046	.006**
Agreeableness	-0.133	0.069	.057
Conscientiousness	0.276	0.051	.000**
Openness	0.115	0.069	.102
Neuroticism	-0.052	0.032	.115
Personality interaction			
Openness X Agreeableness	-0.015	0.010	.168
R^2		.349	
Wald F		66.833**	

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

Discussion

Hypothesis 1 postulated that the extroversion trait was positively associated with net worth. The extroversion trait variable coefficient was calculated as .129 with a significance level of .007, controlling for all other variables (i.e., in model two in Table 2.7). This result supports a positive relationship between these two variables. (i.e., a one unit increase in the extroversion trait score is associated with a 12.9% level increase in the value for net worth, with log net worth used in analysis; therefore, change is calculated as *B* coefficient x 100 = percentage). Interpreting this result from a psychological type theory lens would convey that the mental associations related to the extroversion domain (i.e., an external mental focus) are associated with net worth levels.

This finding was interesting because although previous research identified increased levels of extroversion to be associated with higher income (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Sutin, Costa, Miech, & Eaton, 2009; Viinikainen, Kokko, Pulkkinen, & Pehkonen, 2010), other past research has also identified the extroversion trait with lower levels of total dollar savings (Nyhus & Webley, 2001). Potentially, the higher income earned by those with higher extroversion scores offset their lower savings to increase net worth levels. Additional research in this area would be useful to further examine the dynamics between personality, savings behavior, and net worth. Another potential reason for higher net worth levels being associated with increased extroversion scores could be related to risk tolerance. Higher return potential could exist with higher risk tolerance levels, and previous research has identified extroversion to be positively associated with risk tolerance (Pompian & Longo, 2004; Li & Liu, 2008; Filbeck, Hatfield, & Horvath, 2009). Additional research in this area would be benefical to further examine the relationship between extroversion, net worth, and risk taking. Specifically, it

would be interesting to study how risk tolerance and extroversion inter-related to influence net worth.

Hypothesis 2 proposed the openness trait as being positively associated with net worth. Previous studies did not find any associations between the openness trait and spending/saving behavior (Nyhus & Webley, 2001; Verplanken & Herabadi, 2001; Duckworth & Weir, 2010; 2011). However, previous literature does exist reporting this trait as being associated with high income levels (Viinikainen, Kokko, Pulkkinen, & Pehkonen, 2010). Regression analysis in this study did not find any significant relationship between the openness trait and net worth and, as a result, no support for Hypothesis 2 was provided. From a psychological type theory lens, this would mean that the mental preferences related to intuition and sensing functions (i.e., mental preferences related to how information is mentally acquired) is not associated with net worth.

Hypothesis 3 posited agreeableness as being positively associated with net worth. The agreeableness trait variable in this report was calculated at -.0158 with a significance level of .002. This finding suggests that a significant negative relationship exists between these two variables, whereas, a one unit increase in the agreeableness score is associated with a 15.8% decrease in net worth values. Past research regarding a significant association between the agreeableness trait and income has been identified, however, the results of this study showed the agreeableness trait and net worth as being inversely related. Still, this finding was consistent with other research literature that associated higher levels of agreeableness as being positively related to higher spending and lower savings behaviors (Nyhus & Webley, 2001; Verplanken & Herabadi, 2001). From a psychological type theory perspective, the results in this study support net worth as being associated with the mental preferences regarding how decisions are made

based upon either a feeling domain (i.e. an approach that is empathetic and compassionate to others) or a thinking domain (i.e., an objective and rational approach).

Hypothesis 4 proposed a positive association between the conscientiousness trait and net worth. The results of the regression analysis calculated the conscientiousness variable coefficient as .274 with a $p < .05$ level significance level. This supports the hypothesis with a significant positive association between these two variables, whereas, a one unit increase in the conscientiousness trait score is associated with a 27.4% increase in net worth values. This result is consistent with previous studies, which identifies the conscientiousness trait as being related to higher lifetime earnings (Duckworth & Weir, 2010) and lower levels of spending but higher levels of savings (Nyhus and Webley,2001; Verplanken & Herabadi, 2001). From the lens of psychological type theory, this supports the mental associations related to the perceiving domain (i.e., a preference for data gathering) and the judging domain (i.e., a preference for decision making) are related to net worth.

Hypothesis 5 postulated neuroticism and net worth as having a negative association. Previous research findings have found neuroticisms as being associated with lower lifetime earnings (Duckworth & Weir, 2010). However, the findings in the regression analysis for this study could not support a hypothesis of negative association between this trait and net worth. Although this study did calculated the neuroticism coefficient as a negative value, the findings was not significant at the $p < .05$ level.

In addition to the five hypotheses, three additional questions were examined regarding the interaction of trait combinations. The first question explored if the interaction between the extroversion trait and the openness trait was associated with net worth. The study results calculated a significant coefficient but at a reduced R^2 score than the model with traits coded

individually suggesting that individual representation of traits score better model the relationship between personality and net worth. Additional research would be warranted to further explore this relationship. Potentially, research could incorporate mediation analysis or other types of conditional path analyses.

The second question examined if the interaction between the extroversion trait and agreeable trait was associated with net worth. The third question examined if the openness trait interaction with the agreeableness trait was associated with net worth. Neither of these personality trait combinations had any significant associations with net worth.

Conclusion

Previous studies have established the influence of personality on financial behavior and economic outcomes (Nyhus & Webley, 2001; Boyce & Wood, 2011; Harrison & Chudry, 2011). The purpose of this study was to examine how personality affects one type of economic variable, namely, net worth. According to psychological type theory, personality is based upon how individuals obtain, focus, and process information, which can affect preferences and behavioral choices. The findings in this study provide useful information to better understand the relationship between personality and net worth to assist with guiding financial planning practitioners to better work with clients.

Preference and competency are two different issues. It is important to note that personality is an outward reflection of mental preferences and not skill competencies (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Understanding this difference is meaningful for financial planning practitioners for assisting individuals with implementing their financial plans and promoting desired economic outcomes. If people understand how their preferences

potentially influence economic outcomes, they can make a conscious effort to focus on the preferences that support preferred outcomes, as well as, developing behavioral competencies outside their behavioral and mental preferences that may further promote more advantageous results.

Extroversion was shown as being positively associated with increased net worth levels. By understanding how the extroversion trait is associated with psychological type theory, financial planners can leverage how attention is focused by their clients to promote growth in net worth levels. According to psychological type theory, individuals with higher extroversion levels have a preference for focusing their attention outwardly to the external environment rather than mentally focusing internally (Jung, 1971). To assist clients in growing their net worth levels, financial planners can help clients with developing competencies related to the extroversion trait and externally focusing individual attention outwardly rather than inwardly. For example, a financial planner may ask a client to identify an outward-focused financial goal, such as the financial needs of one's family, rather than the inward focus financial goals for oneself.

Higher conscientiousness trait scores were also found to be associated with higher net worth levels. People with higher conscientiousness levels have a preference for decision making in psychological type theory (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Based upon the findings of this study and a psychological type theory perspective it appears that a mental inclination for decision making, rather than delaying decision making, is related to achieving higher levels of net worth. Utilizing this perspective to increase net worth levels, financial planners could encourage their clients to make decisions regarding their finances rather than delaying decisions to a later point in time.

Higher agreeableness scores were identified as being negatively associated with higher net worth levels. In the psychological type theory, the agreeableness trait is related to the thinking/feeling domain. The thinking/feeling domain is associated with how people prefer to make decisions. Those with higher agreeableness trait levels are associated with a preference for feeling domain sub-traits such as tenderness, accommodating, and compassion, while those with lower agreeableness levels are associated with a preference for thinking domain sub-traits such as objectivity, logic, and reasonableness (Quenk, Hammer, & Majors, 2001). Interpreting the results of this chapter's analysis with psychological type theory, financial planners should emphasize on developing sub-traits with their clients that are associated with lower agreeableness (i.e., objectivity, logic, and reasonableness) to support building higher levels of net worth.

Limitations in this study include limiting study participants to only household financial respondents from the Health and Retirement Study (HRS) data set. For married households, only one individual was identified as the financial respondent and, as a result, the other individual in the married relationship was excluded from the analysis. Although the financial respondent's personality traits (i.e., in a married household) may potentially affect financial variables more than the non-financial respondent's traits, this created an incongruity in the analysis for married households since personality trait is an individual trait while net worth is a household asset. Another limitation included the use of self-reported data. The HRS data set is based upon self-reported data from individuals. Potential for error exists since self-reported data may include incorrect self-assessments. If self-assessed responses could be collaborated with other information sources, then the validity of the data could be improved. Age was a third limitation of this study. The HRS data set was designed to study individuals age 50 and above. As a result,

only those age 50 and above were included in this study. It would be of interest to see if the findings in this study also apply to younger individuals or if different associations exist.

The focus of the research in this chapter examined the direct relationship between personality traits and net worth. Suggestions for additional research to build upon this study include incorporating moderation analysis, testing personality based upon threshold levels rather than a continuous measure, and examining other financial outcomes that may be associated with personality. Moderation analysis would be of interest to examine how the association between personality and net worth potentially may be influenced by other intervening variables such as family size, marital status, or education level. Another area for potential research may incorporate the use of personality threshold levels. Personality can be represented both as a continuous variable and as a nominal variable. In some personality measurement systems, (i.e., such as the MBTI® framework), the use of thresholds values to create separate preference categories are used to examine how personality influence different outcomes. Preference categories need not be limited to either or categories, but, may also include low, medium, and high trait categories. Other areas for future research include other types of financial outcomes that may be associated with personality. For example, it would be of interest to examine the association between personality with life insurance coverage by individuals, people's retirement age selection, or education saving decisions by individuals for their children's future college expenses.

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Chapter 3 - The Association between Personality and Stock Ownership

Introduction

The financial assets acquired by households represent stockpiles of potential resources (Beverly, Sherraden, Cramer, Shanks, Nam, & Zhan, 2008). As resources, these assets serve multiple purposes (Gokhale, 2000). As investments, asset holdings generate possible returns to increase future consumption, potentially increasing individuals' future living standards. As sources of security, people can utilize their holdings to guard against both anticipated future shortfalls and unexpected adverse conditions. Saved wealth also enables the acquisition of goods and services that require substantial lump-sum expenditures that may not be accessible via income alone. Hence, it follows that the form in which people hold their wealth would be an important factor in determining how wealth is accumulated.

People have access to a variety of different types of financial vehicles to accumulate wealth. For example, real estate, savings deposit accounts, and financial securities, such as stocks and bonds, represent common vehicles individuals can use to store the value of their financial wealth. In addition to the amount of savings that occurs, the choice of a financial vehicle can influence the growth potential people realize and the risk undertaken (Van Soest & Kapteyn, 2006). For example, although stocks exhibited more volitility than other accumulation vehicles, stock market returns historically have outperformed other asset classes. Between December 2002 and December 2012, the market return for the S&P 500 was 7.10%, with a standard deviation of 14.77% (S&P Dow Jones Indices, 2013). During this same time period, the Case-Shiller 10-city

composite price index return was only 1.09%, with a 4.26% standard deviation, and the S&P/BGCantor 7-10 U.S. treasury bond index return was just 6.15% with a standard deviation of 6.86%.

Despite higher past returns, attitudes against stock ownership exists. A telephone survey by Harris Interactive conducted in 2013 of 1,000 individuals, ages 25 to 75 with incomes of $25,000 or more, reported that only 24% of respondents were confident that the stock market was a place to invest for retirement (Wells Fargo, 2013). Furthermore, 52% of the survey respondents expressed not wanting to own stocks due to fear of loss because of the ups and downs associated with the stock market. A survey sponsored by Nationwide Financial of 783 people, ages 18 and older with at least $100,000 in investable assets, reported similar attitudes regarding investing in stocks (Nationwide, 2013). In this survey, 62% of respondents reported being fearful of stock ownership.

As previously stated, despite the higher return potential offered by stocks over other asset classes, stock ownership may not be a desired asset accumulation vehicle by all individuals. The research in this chapter examined if personality and stock ownership were related. Specifically, the research focus this chapter sought to explore was to determine the association, if any, between personality, as defined by the psychological type theory, and the likelihood of stock ownership. The remainder of this chapter is organized as follows: (a) literature review, (b) theoretical framework, (c) methodology, (d) results, (e) discussion, and (f) conclusion.

Literature Review

Previous research literature has provided some insight as to what factors are associated with stock ownership. Thus far, existing literature has identified two main variable categories as

being associated with stock ownership: psychological variables; and demographic factors. This section reviews these variables and provides a rational for incorporating personality variables to further understand stock ownership.

Psychological Variables

Psychological factors influence stock ownership (Zhong & Xiao, 1995). However, literature regarding this topic has generally been limited to risk tolerance studies (Filbeck, Hatfield, & Horvath, 2005; Li & Liu, 2008; Filbeck, Hatfield, & Horvath, 2009). In these types of research, investment choice between risk free and risky assets are based upon people's risk perception (Weber, Siebenmorgen, & Weber, 2005) and risk aversion levels (Hanna & Lindamood, 2009; Hanna, Waller, & Finke, 2008). However, beyond these types of risk tolerance studies, research investigating the relationship between stock ownership and other types of psychological variables is limited.

One basic psychological factor that may influences people's decision making process is their personality (Paunonen & Ashton, 2001; Paunonen, 2003). Personality can be defined as the set of organized characteristics held by people that uniquely influence their cognitions, motivations, and behaviors in various situations (Ryckman, 2004), and it plays a crucial role in how people make decisions (Bensi, Giusberti, Nori, & Gambetti, 2010). In the area of financial planning, there have been many studies linking personality category types with the financial decision making process (Parker & Spears, 2002; Mckenna, Hyllegar, & Linder, 2003). For example, personality has been linked to risk tolerance, record keeping, and mental biases. Furthermore, research supports individuals with the extraversion personality trait as being more prone to taking risks and as demonstrating a greater willingness to invest than those with the introversion trait (Pompian & Longo, 2004; Mayfield, Perdue, & Wooten, 2008). Potentially,

other types of personality impacts may influence household stock ownership. However, research exploring the relationship between personality and stock ownership is generally nonexistent.

Demographic Factors

What has been examined in regards to stock ownership is the influence of demographic variables. Demographic variables related to finances play important roles both individually and collectively for understanding stock ownership. Specifically, net worth, income, and home ownership have been demonstrated to effect stock ownership (Campbell, 2006). In the case of net worth and income, generally, as these variables increase, so does the likelihood of stock ownership. Using data from the Survey of Consumer Finance, Bertaut and Starr-McCluer (2000) found as wealth inceased via net worth and income, the household share percentage in stocks and financial assets increased. These findings were further supported by Campbell (2006) who identified low wealth households as generally only holding on to liquid assets and vehicles. These types of households generally did not have available assets to invest in stocks due to their incomes not significantly exceeding fixed living costs (Guiso & Jappelli, 2005) nor having excess funds available after accounting for short-term financial needs (Zhong, & Xiao, 1995; Xiao & Noring, 1995). Wolff (2010) further reported that 90% of all investment wealth ownership in the United States is concentrated by the top 10% of households. Wolff utilized Survey of Consumer Finance data from 1983 to 2007 for his research.

For many individuals, owner-occupied housing represents the biggest asset they have within their financial portfolio (Cocco, 2005). Residential homes generally serve as long term investments and as a consumption good providing a stream of shelter services to their owners (Yamashita, 2003; Campbell, 2006). However, at lower and middle income levels, home ownership does crowd out available funds for investing in other areas, such as stocks (Cocco,

2005). For wealthier households, excess funds are available to invest; furthermore, higher wealth levels can also allow for more risky type of behavior, such as stock ownership, since the existance of additional assets can cushion the impact of any potential adverse efffects (Guiso & Jappelli, 2005). Wealthier individuals also generally tend to be more knowledgeable and more risk tolerant than their less wealthy counterparts (Dwyer, Gilkeson, & List, 2002; McCarthy, 2004; Campbell, 2006). One explanation for this is simply the effects of experience. Wealthier individuals generally have more opportunities to invest in financial products and, hence, time to acquire additional investment sophistication and financial awareness.

Age has also been identified as an important factor. A number of studies have found age to be positively correlated with stock ownership (Cocco, Gomes, & Maenhout, 2005; Shum & Miquel, 2006; Dow, Jr., 2009). A study by Dow (2009) using the Survey of Consumer Finances also found that although stock ownership increased with age, the level of increase slowed at older age levels.

Race is another variable related to stock ownership. A Pew Research Center analysis of data from the U.S. Census Bureau's Survey of Income and Program Participation found stock ownership rates vary based upon race and ethnicity (Kochlar, Taylor, & Fry, 2011). The study looked at stock and mutual funds ownership rates and found Whites and Asians as having greater investment ownership levels than Blacks and Hispanic households. Specifically, in 2009, Whites had the highest stock and mutual funds ownership levels ($30,984) with Asian closely following (i.e., $30,000). Hispanic stock and mutual fund ownership rates were roughly half the amount of Whites (i.e. $15,000). Stock ownership rates by Black households were less than a thirds of Whites (i.e., $8,000).

Education has generally been linked to wealth. For example, data from the Survey of Consumer Finances showed median income levels in 2004 and 2007 to increase as education levels increased (Bucks, Kennickell, & Moore, 2006). Campbell (2006) expanded this relationship to stock ownership. Controlling for income, net worth, and age, Campbell identified as direct positive relationship between equity ownership and three education categories: (a) high school diploma, (b) college diploma, and (c) graduate school. One explanation of this relationship provided by Zhong and Xiao (1995) is that higher levels of education allows people to have broader exposure to information and leads to better optimal selection of financial decisions.

The Survey of Consumer Finance also identified gender as being associated with stock ownership. Zhong and Xiao (1995) found females were less likely to invest in stocks than males. One reason for this is that past research literature has identified women as less risk tolerant than men, and, as a result, less likely to invest in riskier, but higher returning, assets such as stocks (Gerrans & Clark-Murphy, 2004). Dwyer, Gilkeson, and List (2002) examined a survey conducted by the Office of the Comptroller of the Currency and the Securities Exchange Commission of approximately 2,000 mutual fund investors and found that women take less risk than men in mutual fund investing. In another study, professional male and female investment advisors were compared. Two hundred nine Chartered Financial Analysts (CFA's) and 274 Certified Financial Planners (CFP®'s) were surveyed. The study found women financial professionals placed greater emphasis on downside and loss potential risk than their male counterparts in investing.

Interestly, when gender was combined with marital status, investment choices show different preferences. Single women and married men were less likely than single men to choose

"mostly stocks" as opposed to "mostly bonds" for their own investments (Sunden & Surette, 1998). In a similar studies, married women were more likely to choose riskier investing options than single women (Gerrans & Clark-Murphy, 2004; Bertocchi, Brunetti, & Torricelli, 2011). One potential reason for women being more conservative than men is based upon a biologically based view, which suggests that women are more conservative due to evolutionary adaption to increase the chances of their survival (Olsen & Cox, 2001). Since they act as child bearers and mothers, they are exposed to greater physical vulnerability resulting in physiological adaptations making women less sensation seeking and more risk adverse.

Marriage is also a source of financial security. Households have the potential benefit of two individuals to provide labor output. Furthermore, women become entitled to at least a portion of the gender gap in labor earnings by getting married (Bertocchi, Brunetti, & Torricelli, 2011). One result is higher wealth acquistion by married households compared to single households. Schmidt and Sevak (2006) found that the total net worth of married 2001 U.S. households was $262,929, which was more than twice that of single households ($112,547 for female-headed and $119,861 for male-headed). As a result, married households have the potential to incorporate more risky type assets within their portfolio because they have higher level of financial security (Bertocchi, Brunetti, & Torricelli, 2011).

Theoretical Framework

Psychological type theory puts forward that preference is determined by personality, which is the result of how individuals process information and the direction of their focus (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Previous research has already found associations between personality and financial decision making (Parker & Spears, 2002;

Mckenna, Hyllegar, & Linder, 2003; Pompian & Longo, 2004). One aim of this chapter was to expand research in this area by examining the relationship between personality and stock ownership. This section reviews the key points of the psychological type theory, identifies how this theory was operationalized, and identifies the hypotheses examined in this chapter.

As previously reviewed in Chapter Two, psychological type theory outlines a cognitive framework for how information is processed and focused to create preference variations for behavior and decisions making (Bargar & Hoover, 1984). In this cognitive framework, Jung (1971) outlined how mental functions combine with mental attitudes to create different psychological types (see Chapter Two for a deeper discussion regarding these concepts). These psychological types determine personality preference dimensions. Theses preference dimensions and their descriptions are shown in Table 3.1.

Table 3.1

Type Dimensions in the Psychological Type Theory (Briggs Myers, McCaulley, Quenk, & Hammer, 2009)

Psychological Type	Description
Extroversion/introversion	Extroversion denotes a preference for focusing outward mentally while introversion focuses inward mentally.
Sensing/intuition	Sensing denotes a preference for utilizing five senses to process information that is observable while intuition denotes a preference for focusing on meaning, associations, and relationships which can promote creativity and imagination.

Psychological Type	Description
Thinking/feeling	Thinking denotes a preference for making decisions based upon impersonal and objective logic while feeling denotes a preference for making decision based upon considerations regarding one's values and other people's concerns.
Perceiving/judging	Perceiving denotes a preference for focus on the seeking addition information when making decisions while judging denotes a preference for making a decisive decision.

Psychological types have been measured as both dichotomous and continuous variables. Briggs Myers, McCaulley, Quenk, and Hammer (2009) called for a dichotomous representation of psychological types with dimension being an either/or choice. For example, utilizing the extroversion/introversion type dimension, a nominal choice is made for a preference for either extroversion behavior or introversion behavior. Alternatively, McCrae and Costa (1989; 2006) proposed continuous measurement representation of psychological type dimensions. In this framework, a continuous spectrum exists between psychological types. For example, a person could be mainly extrovert, partly extrovert and partly introvert, or mainly introvert under a continuous methodology. The choice of dichotomous or continuous representation of psychological type is based upon what is being measured. If the desire is to measure preference, then dichotomous representation is appropriate. On the other hand, if the desire is to measure strength, then continuous representation is appropriate.

Utilizing personality traits contained in The Big Five model, McCrae and Costa (1989; 2006) suggested using Big Five traits to represent psychological type dimensions due to the

positive relationship between Big Five traits and psychological types. A number of other studies support McCrae and Costa's proposal with similar findings regarding the similarities between psychological type dimension and Big Five traits (Furnham, Jackson, Fordes, & Cotter, 2001; Furnham, Moutafi, & Crump 2003; Furnham, Moutafi, & Paltiel, 2005; Furnham, Dissou, Sloan, & Chamorro-Premuzie, 2007; Ragossino & Kelly, 2011). The study in this chapter will use personality traits to represent psychological type domains. Table 3.2 identifies the corresponding Big Five traits with their related psychological type counterparts (see Chapter Two for a more detail review regarding the use of personality traits to measure psychological type dimensions).

Table 3.2

Big Five Personality Traits and Related Type Domains (McCrae & Costa, 2006; Furnham, Moutafi, & Crump, 2003)

Big Five Continuous Trait	Psychological Type Domains
Extroversion	Preference for the extroversion domain (outward focus and attention) over the introversion domain (internally focused)
Conscientiousness	Preference for the judging domain (decision making) over the perceiving domain (data gathering)
Openness	Preference for the intuition domain (imagination, creativity, and symbolism) over and the sensing domain (observable, concrete, and realistic)

Big Five Continuous Trait	Psychological Type Domains
Agreeableness	Preference for the feeling domain (accommodating, empathetic, and compassionate) over the thinking domain (logically, critical, and reasonable)
Neuroticism	Combination of preferences for a higher introversion domain (internally focused) and a lower thinking domain (logically, critical, and reasonable).

Psychological type theory communicates that preference variations are due to the different ways people mentally process information and direct their focus, as expressed in their personality, and can result in different types of behaviors, outcomes and choices (Jung, 1971; Briggs Myers, McCaulley, Quenk, & Hammer, 2009). The focus of this chapter's research was to examine how personality trait preference was associated with stock ownership. The following is a list of hypotheses that were examined within this chapter:

Hypothesis 1: The extroversion personality trait preference is positively associated with stock ownership.

Hypothesis 2: The openness personality trait preference is positively associated with stock ownership.

Hypothesis 3: The agreeableness personality trait preference is negatively associated with stock ownership.

Hypothesis 4: The conscientiousness personality trait preference is positively associated with stock ownership.

Hypothesis 5: The neuroticism personality trait preference is negatively associated with stock ownership.

Type theory combined with past existing research can be used to infer the direction of association between personality and stock ownership behavior. According to type theory, a preference for higher extroversion is associated with an outward focus preference for developing an awareness for the external environment and a preference for lower extroversion (introversion) is associated with a preference for focusing on one's inner thoughts and emotions (Jung, 1971). Based upon this viewpoint, an extroversion preference would support stock ownership since owning stock requires an awareness of external issues. Furthermore, existing research regarding personality and risk tolerance supports this viewpoint. Past research has found a positive association between the extroversion preference and higher risk tolerance levels (Soane & Chmiel, 2005; Li & Liu, 2008). Since higher risk tolerance and stock ownership are positively related (Frigns, Koellen, & Lehnert, 2008), it would support extroversion as being positively related to stock ownership because this trait is also positively related to risk tolerance which is in keeping with the first hypotheis above.

The openness trait is associated with the initution domain in psychological type theory, which is associated with a preference for imagination and creativity over facts and the observable (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Past research has also found the openness trait as being associated with higher risk tolerance levels (Soane & Chmiel, 2005). Type theory's description of the initution domain preference along with past research regarding openness and risk tolerance supports a positive association between the openness trait and stock ownership as expressed in the second hypothesis.

Limited support can be found supporting an association between the thinking domain preference and risk tolerance. A preference for the thinking domain is associated with a preference for lower levels of agreeableness (Furnham, Moutafi, & Crump, 2003). A study surveying college students found an association between the thinking domain and higher levels of risk tolerance, but, the sample size of the study was limited to only 85 individuals (Filbeck, Hatfield, & Horvath, 2005). The findings in this past study would support a negative association between the agreeableness trait and stock ownership, which is in keeping with the third hypothesis.

The conscientiousness trait is associated with a preference for the thinking domain in type theory and a preference for decision making (Furnham, Moutafi, & Crump, 2003). Past research has identified a lack of preference for the thinking domain as being associated with higher levels of risk aversion (Soane & Chmiel, 2005). This would support the conscientiousness trait as being positively associated with stock ownership, as expressed in the fourth hypothesis.

The neuroticism trait is associated with a preference for both the introversion domain and the feeling domain. Both of these preferences have been associated with higher levels of risk aversion in past research (Filbeck, Hatfield, & Horvath, 2005; Soane & Chmiel, 2005; Li & Liu, 2008). As a result, Hypothesis 5 supports a negative association between neuroticism and stock ownership.

In addition to the individual dimensions, psychological type theory also states that these dimensions interact with one another to influence behavior and preference variations (Jung, 1971; Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Specifically, where mental energy is directed, represented by the extroversion/introversion dimension (i.e., extroversion trait) interacts with the mental dimensions of how information is processed which is represented by both the

thinking/feeling dimension (i.e., agreeableness trait) and the perceiving/judging dimension (i.e., conscientiousness trait). In addition, the thinking/feeling and perceiving/judging dimensions also interact with each other. As a result, the following additional exploratory questions were also examined:

Exploratory question 1: What is the association between the interaction of extroversion and openness with stock ownership?

Exploratory question 2: What is the association between the interaction of extroversion and agreeableness with stock ownership?

Exploratory question 3: What is the association between the interaction of openness and agreeableness with stock ownership?

Type theory expresses different preference interactions should produce difference outcomes. However, research regarding the interaction of personality preference traits in the topic of stock ownership is not available to serve as a guide for the direction of these relationships. This chapter's analysis provided an initial examination for these types of associations.

Methodology

Data and Sample

This study utilized core survey and Psychosocial Lifestyle Questionnaire data from the 2010 panel of the Health and Retirement Study (HRS). The survey data is collected via a complex sampling design format. The HRS dataset is a national longitudinal survey conducted by the Survey Research Center at the University of Michigan. The survey is funded by the National Institute on Aging and the Social Security Administration. The HRS collects

information to provide multidisciplinary data for researchers to help address the challenges and opportunities of aging. The objective of data collection by the HRS is to (a) explain the antecedents and consequences of retirement; (b) examine health, income, and wealth relationships over time; (c) examine life cycle wealth accumulation and consumption patterns; (d) monitor disability from work; and (e) examine how economics, family, and program resources affect retirement, dis-savings, health declines, and institutionalizations (National Institutes of Health, 2007).

One individual per household in the HRS data file was identified as the financial respondent and was responsible for answering the HRS financial questions (RAND Center for the Study of Aging, 2011). This study selected only financial respondents to be included for analysis purposes. A second survey called the Psychosocial and Lifestyle Questionnaire was provided to 50% of the respondents that were randomly selected after core HRS data was collected (Smith, Fisher, Ryan, Clarke, House, & Weir, 2013). The Psychosocial and Lifestyle Questionnaire is a paper survey that respondents were asked to complete and return by mail. This written survey was completed by 5,402 financial respondents in 2010. The total size of the sample population used in this study was 5,007, which represented respondents who had sufficiently completed the demographic and financial questions as well as the personality questions from the Psychosocial and Lifestyle Questionnaire to be included in this analysis. Based upon complex sampling procedures, the 5,007 respondents when weighted were designed to represent a total of 23,116,616 individuals.

Variables

The dependent variable in this research was ownership of stocks either as individual stock holdings or as mutual fund stock holdings. The independent variables of interest for this

study were personality type preferences as measured by personality traits (McCrae & Costa; 1989; 2006). In the HRS survey, respondents were asked to rate 31 words from one to four based upon how well the words described themselves. Each word was an adjective associated with one of The Big Five personality traits (discussion regarding the personality variable was provided in Chapter Two in greater detail). The Cronbach's alpha scores were .75 for extroversion, .79 for agreeableness, .68 for conscientiousness, .80 for openness, and .71 for neuroticism. Cronbach's alpha is used to measure scale reliability with preferred scores at .70 or higher. Scores slightly below .70 are generally deemed acceptable (Field, 2013).

For the purpose of this study, low and high personality trait preferences were created from the personality traits scores. Dichotomous representation was used to identify preference rather than strength as discussed in the literature review section. The use of preference to categorize personality has extensively been used in past research ((Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Median values were used to separate between low and high personality preference values (the use of mean values yielded same results in analysis). Table 3.3 identifies the coding format for individual personality preference variables and Table 3.4 shows the coding format for personality preference interaction variables.

Table 3.3

Personality Trait Preference Coding Format

Variables	Measurement
Extroversion	Low extroversion score below sample medium coded as 1: high extroversion coded as 2

Variables	Measurement
Conscientiousness	Low extroversion score below sample medium coded as 1: high extroversion coded as 2
Openness	Low extroversion score below sample medium coded as 1: high extroversion coded as 2
Agreeableness	Low extroversion score below sample medium coded as 1: high extroversion coded as 2
Neuroticism	Low extroversion score below sample medium coded as 1: high extroversion coded as 2

Table 3.4

Coding of Interacting Personality Trait Variables

Variables	Coding
Extroversion and Openness Combinations	
Low extroversion low openness	1 equals yes; 2 otherwise
Low extroversion high openness	1 equals yes; 2 otherwise
High extroversion low openness	1 equals yes; 2 otherwise
High extroversion high openness	1 equals yes; 2 otherwise
Extroversion and Agreeableness Combinations	
Low extroversion low agreeableness	1 equals yes; 2 otherwise
Low extroversion high agreeableness	1 equals yes; 2 otherwise
High extroversion low agreeableness	1 equals yes; 2 otherwise

Variables	Coding
High extroversion high agreeableness	1 equals yes; 2 otherwise
Openness and Agreeableness Combinations	
Low openness low agreeableness	1 equals yes; 2 otherwise
Low openness high agreeableness	1 equals yes; 2 otherwise
High openness low agreeableness	1 equals yes; 2 otherwise
High openness high agreeableness	1 equals yes; 2 otherwise

Age, gender, income, net worth, education level, race, and marital status represented control variables. These control variables were identified in the literature review section as being associated with stock ownership in previous research. Table 3.5 identifies the measurement units for the dependent variable and the control variables.

Table 3.5

Measurement of Dependent and Control Variables

Variables	Measurement
Dependent Variable	
Stock ownership	1 if respondent reported owning either individual stocks or stock mutual funds; 2 otherwise
Independent Variables	
Gender and marital status	
Single male	Used as reference category

Variables	Measurement
Single female	1 for single female; 2 otherwise
Married male	1 for married male; 2 otherwise
Married female	1 for married female; 2 otherwise
Age	
50-59	Used as reference category
60-69	1 if respondent reported age between 60 to 69; 2 otherwise
70-79	1 if respondent reported age between 70 to 79; 2 otherwise
80 plus	1 if respondent reported age between 80 or above; 2 otherwise
Hispanic	
Hispanic	1 if respondent reported as Hispanic; 2 otherwise
Race	
White	Used as reference category
Black	1 if respondent reported as Black; 2 otherwise
Other	1 if respondent reported as other; 2 otherwise
Education	
Less than high school	Used as reference category
High school or GED	1 if respondent reported highest level of education as either high school diploma or GED; 2 otherwise

Variables	Measurement
Some college	1 if respondent reported highest level of education as some college; 2 otherwise
Bachelor's degree	1 if respondent reported highest level of education as bachelor's degree; 2 otherwise
Post-graduate degree	1 if respondent reported highest level of education as a post-graduate degree; 2 otherwise
Homeownership	1 if respondent home owner; 2 otherwise
Log household income	Continuous, one was added to zero and positive household income then logged
Log household net worth	Continuous, one was added to zero and positive household income then logged

Empirical Model

The general model utilized in this research to establish the association of personality on a specific type of financial asset ownership was:

$P(Y=1) = F (b_0 + b_1$ demographic variable $1 + b_2$ demographic variable $2 \ldots + b_n$ demographic variable $n + b_1$ demographic variable $1 + b_{n+1}$ personality preference type $+ \varepsilon)$

The dependent variable represented by P(Y=1) in this model refers to the probability of owning a specific type of financial asset (i.e., stock, bond, or financial real estate). A value close

to ‘0’ for Y means the probability of owning a specific financial asset is very unlikely, and a value close to ‘1’ means ownership is very likely to occur. This probability is a function of a number of independent variables. The Y intercept is represented by b_0. The variables b_1 demographic variable 1 to b_n demographic variable n represent previously established control variables identified by existing literature as represented in Table 3.3. The variable b_{n+1} personality type represented specific personality type preferences. The final term ε in the empirical model represents the residual error term. The expected relationships between the independent variables and the dependent variable based upon existing literature are identified in Table 3.6.

Table 3.6

Expected Relationship between Independent Variables and Stock Ownership

Independent Variable	Effect on Dependent Variable (stock ownership)
Gender (male)	+
Age	-
Race (White)	+
Race (Black)	-
Education	+
Marital status (married)	+
Homeownership	-
Household income	+
Household net worth	+

Independent Variable	Effect on Dependent Variable (stock ownership)
Extroversion	+
Conscientiousness	+
Openness	+
Agreeableness	-
Neuroticism	-
Extroversion/openness interaction	Unknown
Extroversion/agreeableness interaction	Unknown
Openness/agreeableness interaction	Unknown

Statistical Analysis

Binary logistic regression analysis was utilized in this study. Logistic regression is appropriate when the dependent variable is categorical and dichotomous, and the independent variables are categorical, continuous, or a combination of both (Field, 2013). Specifically, within this study, the dependent variable was dichotomous (stock ownership as one and no stock ownership as zero) and the independent variables were also coded both as categorical and continuous.

Logistic regression initially starts with a baseline or null model (Field, 2013). In this null model, no other information is considered other than the frequency of the dependent variable category outcome occurrences. For example, if the possible outcomes of a two category dependent variable are *'yes'* and *'no'* and the outcome include 75 *'yes'* results and 25 *'no'* results then only the frequency of 75 and 25 are incorporated in the baseline model. Compared to this baseline null model, which is a proposed model. In the proposed model, one or more dependent

variables are included, and the proposed model is compared to the baseline model to see if any improvements in determining the dependent variable occurred. Subsequent proposed models can also be added to determine if additional improvements can be achieved.

In this study, the data set being analyzed was developed under complex sampling procedures. In complex sampling, observation values are weighed differently based upon data stratification from no-overlapping segments, data clustering from similar segments, and weight functions due to unequal selection probabilities (Aneshensel, 2013). To account for the complex sampling design of the data set, data variable weights are provided by HRS (Smith, Fisher, Ryan, Clarke, House, & Weir, 2013). The variable RAESTRAT was used for the stratification weight, the variable RAEHSAMP was used for cluster weight, and the variable MWGTR was used to adjust the sample selection to account for only 50% of the HRS 2010 panel as being randomly selected to answer the Psychosocial Lifestyle Questionnaire. Analysis of data sets designed under a complex sample format should use complex sample analysis procedures (Heeringa & Connor, 1995; National Institutes of Health, 2007; Neilsen, Davern, Jones, Jr., & Boies, 2009; Nielsen & Seay, 2014). If complex sample analysis procedures are not used, then the potential for Type I errors may increase and result with concluding relationships existing when in reality they do not exist.

The complex samples logistic regression analysis was used in this study. In the first regression model, the initial block of independent variables inputted was demographic control variables. In the second model, personality variables were entered as additional independent variables. Three additional models were added to account for the interaction of personality variables. These included models to test the extroversion and openness, extroversion and agreeableness, and the openness and agreeableness interactions. These models were completed

separately to avoid autocorrelation between the personality variables. For example, the extroversion/openness interaction variables would be highly correlated to the extroversion/agreeableness interaction variables because all the interaction variables have the same extroversion score component.

The pseudo R^2 values and percent concordance of each model were examined. In addition, Wald F-ratios and T-statistics were reviewed. The Wald F statistic was calculated to identify the regression coefficient (*b*) estimate, the exponential value of *b*, and the significance of each independent variable (Field, 2013). The exponential value of *b* is also known as the odds ratio. The odds ratio is greater than one when the probability of an event occurring in one group compared to another (the dependent variable changing between values) is associated with a one unit increase by the independent variable. The odds ratio is less than one when the probability of an event occurring in one group compared to another is associated with a one unit decrease by the independent variable.

Results

Descriptive Statistics

Results from the descriptive statistics are shown in Tables 3.7 and 3.8. A total of 5,007 survey respondents were included in this study. Average household net worth and household income were $113,789 and $37,395 respectively. Approximately 29.5% of the respondents in this study were stock owners, and stock owners generally had higher household net worth and household income levels than non-stock owners. Most respondents in this study were home owners (80.06%), and stock ownership for home owners was at 33.56%.

For the categories of gender and marital status, single males accounted for 15.10% of the study, single females accounted for 31.08%, married males accounted for 33.38%, and married females accounted for 20.44%. Only 20.29% of single males were stock owners, while 21.23% of single females were stock owners. The highest category of stock owners were married males at 35.39%, while 30.74% for married females were stock owners,

In the age categories, 32.60% were between ages 50 and 59, 33.26% were between age 60 and 69, 20.16% were between 70 and 79, and 13.97% were 80 and above. The largest group of stock owners was represented by the age 80 and above category at 31.22%. The youngest group, ages 50 to 59, represented the smallest stock owner category at only 24.03% ownership level. Stock ownership was 28.52% for those between ages 60 and 69, and 27.04% for those between 70 and 79.

Hispanics represented 6.20% of the sample's ethnicity, with a stock ownership level at only 6.77%. Most respondents in this study were Whites (88.22%), followed by Blacks (8.73%), and other races accounted for the remaining of the sample (3.02%). Stock ownership was highest among Whites (30.38%) and lower for Blacks (7.01%) and other races (13.99%).

Respondents without attaining at least a GED or high school diploma represented 10.82% of the sample. Those with a GED or high school diploma represented 53.73%. Respondents who at least attended college (6.16%), graduated from college (17.00%), or achieved a post-graduate degree (12.29%) comprised the remainder of the study. Stock ownership was only 6.93% for those without a GED or high school diploma. Ownership levels represented 22.51% for high school graduates, 30.05% for those with some college, 43.16% for college graduates, and finally 47.18% for those with post-graduate degrees.

Table 3.7

Descriptive Statistics, Continuous Variables (Weighted Percent and Mean)

Variable	Percent	Log (Dollar), Weighted Mean
Household income		4.5727 ($37,385)
Household income, stock owner	29.50%	4.8281 ($67,313)
Household income, non-stock owner	70.50%	4.4755 ($29,888)
Net worth		5.0561 ($113,789)
Net worth, stock owner	29.50%	5.7075 ($509,918)
Net worth, non-stock owner	70.50%	4.7837 ($60,772)

N = 5,007

Table 3.8

Descriptive Statistics, Categorical Variables (Weighted Percent)

Variable	Percent	Percentage Stock Ownership
Single male	15.10%	20.29%
Single female	31.08%	21.23%
Married male	33.38%	35.39%
Married female	20.44%	30.74%
Age Category		
Age 50-59	32.60%	24.03%
Age 60-69	33.26%	28.52%
Age 70-79	20.16%	27.04%

Variable	Percent	Percentage Stock Ownership
Age 80 plus	13.97%	31.22%
Hispanic ethnicity	6.21%	6.77%
White race	88.22%	30.38%
Black race	8.73%	7.01%
Other race	3.02%	13.99%
Education Category		
Less than high school	10.82%	6.93%
High school or GED	53.73%	22.51%
Some college	6.16%	30.05%
College graduate	17.00%	43.16%
Post-graduate degree	12.29%	47.18%
Home owner	80.06%	33.56%
High extroversion	59.92%	28.55%
Low extroversion	44.08%	26.27%
High conscientiousness	53.07%	30.10%
Low conscientiousness	46.93%	24.54%
High openness	47.58%	31.23%
Low openness	52.42%	23.61%
High agreeableness	57.34%	25.43%
Low agreeableness	42.66%	30.26%
High neuroticism	42.93%	25.62%

Variable	Percent	Percentage Stock Ownership
Low neuroticism	57.07%	28.62%
Extroversion Interacting with Agreeableness		
Low extrovert low agree	41.96%	28.62%
Low extrovert high agree	13.96%	19.52%
High extrovert low agree	15.38%	33.18%
High extrovert high agree	28.70%	27.12%
Extroversion Interacting with Openness		
Low extrovert low open	35.91%	23.36%
Low extrovert high open	20.01%	31.56%
High extrovert low open	11.67%	24.41%
High extrovert high open	32.41%	31.03%
Openness Interacting with Agreeableness		
Low open low agree	33.66%	24.90%
Low open high agree	13.92%	20.59%
High open low agree	23.68%	36.97%
High open high agree	28.74%	26.53%

N = 5,007

Regression Analysis Results for Model One (Control Variables)

Model One reports analysis results for the base model which only incorporated the control variables (see Table 3.9). Results reveal that, holding all else equal, the odds of Hispanic individuals owning stocks were 53.6%, which were less than those of Whites. Similarly, the odds

of Black individuals owning stocks were 53.43%, which were also less than those of Whites, holding all else equal.

As far as age, previous research found that stock ownership increased with age (Cocco, Gomes, & Maenhout, 2005; Shum & Miquel, 2006; Dow, Jr., 2009). The findings in this study were only able to identify the age category of 80 and above (using age 50 to 59 as a reference group) as being significant, holding all else equal. The odds of respondents in the age 80 plus category for being stock owners were 44.2% more than those in the reference category. The other age categories (ages 60 to 69 and ages 70 to 79) were not identified as significant.

Using non-high school graduates as a reference category, holding all else equal, all the other higher education categories were identified as significant. These findings were consistent with past research, which identified a positive relationship between education and stock ownership (Bucks, Kennickell, & Moore, 2006; Campbell 2006). The stock ownership odds for high school graduates were 1.734 times more than those who did not graduated from high school. Stock ownership odds for those with some college experience were 2.293 times more than that of the reference category. College graduates' odds were 2.479, and post-graduate degree respondents' odds were 2.803 times more than those who did not graduate from high school.

The financial control variables in this study were all significant. Stock ownership odds ratios for log household income and log household net worth were calculated at 1.657 and 4.932, respectively, holding all else equal. The 4.932 odds ratio associated with net worth was the largest odds ratio value calculated when compared to all other variables. Home ownership did appear to crowd out and lessen the likelihood of stock ownership, which is consistent with the

previous research by Cocco (2005). Homeowners' odds for owning stock were 35.1% less than non-homeowners, holding all else equal.

Interestingly, gender and marital status combinations were not significant to stock ownership in the study. Previous research identify both of these variables as significant to stock ownership (Zhong & Xiao,1995; Sunden & Surette, 1998; Gerrans & Clark-Murphy, 2004; Gerrans & Clark-Murphy, 2004; Bertocchi, Brunetti, & Torricelli, 2011). However, the results of this study could not support this relationship.

Table 3.9

Logistic Regression Results – Demographic Variables and Personality Preference Contributing to Stock Ownership

Variable	Model 1			Model 2		
	B	*SE B*	Exp(*B*) Odds Ratio	*B*	*SE B*	Exp(*B*) Odds Ratio
Single male (reference group)						
Single female	.031	.202	1.031	.067	.201	1.069
Married male	-.183	.178	.832	-.168	.181	.845
Married female	-.012	.199	.988	.047	.205	1.048
Age 50 to 59 (Reference Group)						
Age 60 to 69	.030	.137	1.030	.050	.136	1.051
Age 70 to 79	.100	.150	1.105	.155	.145	1.168
Age 80 plus	.366*	.161	1.442	.429**	.164	1.535

Variable	Model 1			Model 2		
	B	*SE B*	Exp(*B*) Odds Ratio	*B*	*SE B*	Exp(*B*) Odds Ratio
Hispanic ethnicity	-.768*	.298	.464	-.795*	.297	.452
White race (reference group)						
Black race	-.762**	.217	.467	-.744**	.214	.475
Other race	-.109	.423	.897	-.091	.417	.913
No GED/High school (reference group)						
GED/High school	.550**	.183	1.734	.550**	.184	1.733
Some college	.830**	.292	2.293	.819**	.291	2.269
College graduate	.908**	.199	2.479	.888**	.204	2.430
Post-graduate degree	1.031**	.212	2.803	.993**	.216	2.700
Home owner	-.433**	.149	.649	.417**	.148	.659
Log household income	.505**	.128	1.657	.515**	.132	1.673
Log household net worth	1.596**	.119	4.932	1.575**	.119	4.833
Low extrovert preference (reference group)						
High extrovert preference				.095	.113	1.100
Low agree preference (reference group)						
High agree preference				-.342**	.118	.710
Low conscience preference (reference group)						
High conscience preference				.123	.098	1.131
Low open preference (reference group)						

Variable	Model 1			Model 2		
	B	*SE B*	Exp(*B*) Odds Ratio	*B*	*SE B*	Exp(*B*) Odds Ratio
High open preference				.200*	.091	1.221
Low neurotic preference (reference group)						
High neurotic preference				.237*	.103	1.267
Pseudo R^2		.231			.236	
Wald F		39.027**			32.473**	
Percent concordance		76.5%			76.6%	

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

Regression Results for Model Two (Individual Personality Preference)

Model Two added individual personality trait preferences into the regression analysis. The Pseudo R^2 value from Model One, the model with only control variables, to Model Two improved by increasing from .231 to .236. Results from Model Two in Table 3.9 show that agreeableness, openness, and neuroticism preference categories were significantly associated with stock ownership.

In Model two, a preference for high agreeableness was significantly associated with the probability of no stock ownership. Holding all else equal, the odds ratio for stock ownership was 29% less for those respondents with a high agreeableness preference using those with a low agreeableness preference as a reference category. The preference for both high openness (i.e., using low openness preference as a reference category) and high neuroticism (i.e., using low

neuroticism preference as a reference category) increased the odds of stock ownership by 1. 221 and 1.267 times more compared to their reference categories, respectively, holding all else equal.

Regression Results for Personality Preference Interaction Models

Holding all else equal, three interaction personality trait preference combinations were found as significant in this chapter's analysis. The preference combination of low extrovert/high agree in Model Three (see Table 3.10) was negatively associated with stock ownership and had stock ownership odds of 32.8% less than that of the reference category (i.e., the preference combination of low extrovert/low agree). This value was lower than any other odds value that was calculated for any individual trait preference. The interaction combinations for high extrovert/high openness and high openness/low agreeableness were positively associated with stock ownership. The stock ownership odds for the high extrovert/high openness combination were 1.344 times more than its reference group (i.e., low extrovert/low openness in Table 3.11) and the stock ownership odds for the high openness/low agreeableness combination were calculated at 1.403 times more than its reference group (low openness/low agreeableness in Table 3.12).

Table 3.10

Logistic Regression Results – Demographic Variables, Personality Preference, and Preference Interaction of Extroversion and Agreeableness Contributing to Stock Ownership

	Model 3		
Variable	*B*	*SE B*	Exp (*B*) (Odds Ratio)

Variable	Model 3		
	B	*SE B*	Exp (*B*) (Odds Ratio)
Single male (reference group)			
Single female	.070	.200	1.072
Married male	-.168	.181	.848
Married female	.049	.204	1.050
Age 50 to 59 (reference group)			
Age 60 to 69	.049	.137	1.050
Age 70 to 79	.155	.145	1.167
Age 80 plus	.428*	.164	1.535
Hispanic	-.798**	.296	.450
White (reference group)			
Black	-.743**	.214	.476
Other race	-.095	.416	.910
No GED/High school (reference group)			
GED/High school	.551**	.184	1.736
Some college	.822**	.291	2.275
College graduate	.892**	.204	2.439
Post graduate	.992**	.216	2.698
Home owner	-.417**	.148	.659
Log income	.517**	.133	1.677

Variable	Model 3		
	B	*SE B*	Exp (*B*) (Odds Ratio)
Log net worth	1.574**	.120	4.824
Low conscience pref. (reference group)			
High conscience pref.	.125	.098	1.133
Low open pref. (reference group)			
High open pref.	.201*	.091	1.223
Low neurotic pref. (reference group)			
High neurotic pref.	.238*	.103	1.269
Low extrovert/low agree (reference group)			
Low extrovert/high agree	-.397*	.134	.672
High extrovert/low agree	.051	.149	1.052
High extrovert/high agree	-.243	.138	.785
Pseudo R^2	.236		
Wald F	34.884**		
Percent concordance	76.5%		

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

Table 3.11

Logistic Regression Results – Demographic Variables, Personality Preference, and Preference Interaction of Extroversion and Openness Contributing to Stock Ownership

Variable	Model 4		
	B	*SE B*	Exp (*B*) (Odds Ratio)
Single male (reference group)			
Single female	.067	.201	1.069
Married male	-.167	.181	.846
Married female	.048	.206	1.049
Age 50 to 59 (reference group)			
Age 60 to 69	.049	.136	1.050
Age 70 to 79	.155	.145	1.167
Age 80 plus	.430*	.164	1.537
Hispanic	-.793**	.296	.452
White (reference group)			
Black	-.743**	.213	.475
Other Race	-.089	.417	.915
No GED/High school (reference group)			
GED/High school	.549**	.184	1.732
Some college	.819**	.291	2.269
College graduate	.888**	.204	2.431

Variable	Model 4		
	B	*SE B*	Exp (*B*) (Odds Ratio)
Post graduate	.992**	.216	2.697
Home owner	-.417**	.148	.659
Log income	.515**	.132	1.673
Log net worth	1.576**	.120	4.834
Low agreeableness preference (reference group)			
High agreeableness preference	-.342**	.118	.711
Low conscience preference (reference group)			
High conscience preference	.123	.097	1.131
Low neurotic preference(reference group)			
High neurotic preference	.237*	.103	1.267
Low Extrovert/low open (reference group)			
Low extrovert/high open	.236	.130	1.267
High extrovert/low open	.152	.185	1.165
High extrovert/high open	.296*	.119	1.344
Pseudo R^2		.236	
Wald F		31.402**	
Percent concordance		76.5%	

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

Table 3.12

Logistic Regression Results – Demographic Variables, Personality Preference, and Preference Interaction of Openness and Agreeableness Contributing to Stock Ownership

Variable	Model 5		
	B	*SE B*	Exp (*B*) (Odds Ratio)
Single male (reference group)			
Single female	.055	.201	1.056
Married male	-.172	.183	.842
Married female	.039	.205	1.039
Age 50 to 59 (reference group)			
Age 60 to 69	.055	.135	1.057
Age 70 to 79	.160	.143	1.173
Age 80 plus	.434*	.162	1.544
Hispanic	-.791**	.294	.453
White (reference group)	-.734**	.215	.480
Black	-.072	.420	.931
Other race			
No GED/High school (reference group)			
GED/High school	.550**	.183	1.733
Some college	.826**	.292	2.284
College graduate	.884**	.204	2.421

Variable	Model 5		
	B	*SE B*	Exp (*B*) (Odds Ratio)
Post graduate	.998**	.216	2.712
Home owner	-.433**	.149	.654
Log income	.510**	.131	1.665
Log net worth	1.581**	.120	4.861
Low extrovert preference (reference group)			
High extrovert preference	.097	.113	1.102
Low conscience preference (reference group)			
High conscience preference	.124	.098	1.132
Low neurotic preference (reference group)			
High neurotic preference	.235*	.102	1.265
Low open/low agree (reference group)			
Low open/high agree	-.112	.151	.894
High open/low agree	.339**	.110	1.403
High open/high agree	-.149	.136	.861
Pseudo R^2		.237	
Wald F		32.102**	
Percent concordance		76.4%	

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

Discussion

Hypothesis 1 proposed that a high extroversion preference was associated with stock ownership. Support for this hypothesis was not found since no significant association was found between the extroversion preference, as an individual trait preference, and stock ownership. This finding was of interest since previous studies have identified the extroversion type as being positively associated with higher levels of risk tolerance (Soane & Chmiel, 2005; Li & Liu, 2008), with risk tolerance and stock ownership also being positively related (Frigns, Koellen, & Lehnert, 2008). Interpreting this result from a psychological type theory lens would convey that the mental associations related to the extroversion domain alone (i.e., the preference for an external focus) are not associated with stock ownership.

Hypothesis 2 proposed the preference for high openness as being positively associated with stock ownership. Support for this hypothesis was found in this study. Using the preference for low openness as a reference category, the preference for high openness increased the odds of stock ownership in this study with an odds ratio of 22.1%. This finding was consistent with past studies, which positively associated the openness trait with higher levels of risk tolerance (Soane & Chmiel, 2005; Li & Liu, 2008). The openness trait has been identified in past research literature as being positively associated with intuition mental preference (McCrae & Costa, Jr., 2006). Thus, from a psychology type theory perspective, the decision to own stock may be associated with the mental preferences related to intuition function, such as the preferences for processing information with imagination, creativity, and symbolism (Briggs Myers, McCaulley, Quenk, & Hammer, 2009).

Hypothesis 3 postulated that the preference for high agreeableness was negatively associated with stock ownership. Support for this hypothesis was found in this study, which

would be consistent with past research regarding risk tolerance (Filbeck, Hatfield, & Horvath, 2005). Using the preference for low agreeableness as a reference category, the preference for high agreeableness had a significant odds ratio of .701 for stock ownership (i.e. 29.9% decreased odds for stock ownership). Past research associates the openness trait positively to the feeling domain in psychological type theory (Furnham, Moutafi, & Crump, 2003). Interpreting this hypothesis' finding from a psychological type theory perspective would support the view that mental processes associated with the feeling domain's mental processes (i.e., a preference for the consideration of other people in decision making) are negatively associated with stock ownership.

Hypothesis 4 proposed a positive association between the preference for high conscientiousness and stock ownership. Support for this hypothesis was not provided by the findings in this study. No significant relationship was identified between conscientiousness preference levels and stock ownership. The conscientiousness trait is negatively associated to the percieving domain and positively associated with the judging domain in psychological type theory in past studies (Furnham, Moutafi, & Crump, 2003; McCrae & Costa, Jr., 2006). From a psychological type theory lens, neither the mental associations related to the percieving domain (i.e., preference for data gathering) nor the judging domain (i.e., preference for decision making) are related to the decision to own stocks.

Hypothesis 5 postulated that the preference for high neuroticism was negatively associated with stock ownership. The results of the analysis in this study did find a significant association between the neuroticism preferences and stock ownership. However, the direction of the association between these two variables were opposite than that of the hypothesis. It appeared that the preference for high neuroticism was associated with higher stock ownership.

Using the preference for low neuroticism as a reference category, the preference for high neuroticism had an increased association with stock ownership (i.e., an odds ratio of 1.267).

The findings in this hypothesis were interesting because high neuroticism in past research is associated with a preference for introversion (Ragossino & Kelly, 2011). It appears the findings in this study may contradict previously research since past research has identified introversion and risk tolerance as being inversely related (Soane & Chmiel, 2005; Li & Liu, 2008), and risk tolerance and stock ownership as being positively related (Frigns, Koellen, & Lehnert, 2008). Additional research exploring these relationships would be helpful to further understand the dynamics of these associations.

Three additional exploratory questions were also examined in this study. Psychological type theory suggests that the interactions of certain personality traits are important for stock ownership. But, the theory does not provide meaningful guidance about the direction for these specific cases.

Exploratory question 1 was to examine the association between the preference interaction of the extroversion and openness traits with stock ownership. The study in this chapter examined different possible preference combinations between extroversion and openness (as shown in Table 3.11) and found the preference combination of high extroversion and high openness was significantly associated with stock ownership. The odds ratio was 1.344, conveying that stock ownership was 1.344 times more likely in the presence of this personality preference combination, holding all else equal (i.e., using the low extroversion and low openness as a reference group).

In addition to supporting an association, the finding in this study provides support for the psychological type theory's premise that personality traits interact. From the perspective of

psychological type theory, the findings in exploratory question 1 would communicate that the combination of mental processes associated with high extroversion (i.e., mental preferences for outward external focus) and high openness (i.e., the mental preferences associated with the intuition domain such as creativity and imagination) support stock ownership behavior.

Exploratory question 2 examined the association between the preference interaction of the extroversion and agreeableness traits with stock ownership. The findings in this study support an association. The preference combination of low extroversion and high agreeableness was significant and negatively associated with stock ownership. The odds of stock ownership decreased by 32.8% when this personality preference combination was present (i.e., using low extroversion and low agreeableness combination preference as a reference category). By examining the findings for this exploratory question and comparing it to those in Hypothesis 1 (i.e., examined extroversion alone and found as not significant) and Hypothesis 3 (examined agreeableness alone and found high agreeableness to significantly increased stock ownership odds by 40.8%, which means low agreeableness reduces the odds by 59.2%), it appears that the agreeableness trait is the major variable that is causing the significance. Additional research to explore this would be warranted.

Exploratory question 3 examined the association between the preference interaction of the openness and agreeableness traits with stock ownership. Support for this association was provided in this study. One preference combination between these two personality traits was found to be significant, namely high openness and low agreeableness (i.e., reference category was the combination of low openness and low agreeableness). The stock ownership odds associated with the high openness and low agreeableness preference combination and stock ownership was calculated 40.3% holding all else equal. This finding is consistent with those of

Hypothesis 2, which examined the openness preference alone, but the odds of stock ownership were higher with this combination of openness and agreeableness. However, hypothesis 3 which examined the agreeableness preference alone was not found to be significant with stock ownership.

Conclusion

Psychological type theory postulates that personality is the outward representation of how individuals obtain, focus, and process information. These mental processes, in turn, can affect variations in preferences and behavioral choices (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). The purpose of this study was to examine how psychological type preference expressed though personality is associated with stock ownership.

The findings in this study are important to the financial planning community for understanding how personality traits can influence people's preferences and choices for incorporating financial instruments such as stocks, as part of their overall savings portfolio. For example, financial planning practitioners often incorporated a data gathering session with people before planning recommendations are made (e.g., sessions regarding investment selection). During this data gathering session, planners may find it useful to observe personalities to gain some insight to people's mental preferences. By understanding these mental preferences, financial planners may better understand the types of financial savings vehicles people are more comfortable with having and mentally prefer to incorporate into their saving portfolios.

Additionally, the results within this chapter's analysis may be used by financial planners with existing investment portfolio allocation discussions. For instance, the openness trait was identified as having a positive association with stock ownership. Openness is also positively

associated with the intuition domain within the psychological type theory and negatively associated with the sensing domain (Furnham, Moutafi, & Crump, 2003). The intuition domain relates to imagination, creativity, and symbolism, while the sensing domain relates to logic, reasonableness, and observable-based information processing (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Financial planners may consider incorporating intuition domain type discussions to encourage stock investing for situation whereby equity allocation is too underweighted in an investment portfolio. Likewise, if people's portfolio allocation is too overweighted in equities, then financial planners may use sensing domain type discussions when they review investment strategies with people.

Study limitations include the use of only household financial respondents from the Health and Retirement Study (HRS) data set. Households can be comprised by either single individuals or married couples. For married households, only one individual was identified as the financial respondent and, as a result, only one household member was included in the analysis. Although the financial respondent's personality traits (i.e., in a married household) may potentially affect financial variables more than the non-financial respondent's traits, this created an incongruity in the analysis for married households, since personality trait is an individual trait while net worth is a household asset. Another limitation included the use of self-reported data. The HRS data set uses self-reported survey data from individuals, and people may provide incorrect responses due to incorrect self-assessments. If the survey data responses could be collaborated with other sources then the validity of the data could be improved. A third limitation of this study was age. The HRS data set was designed to study individuals age 50 and above. As a result, only those age 50 and above were included in the analysis for this study. Potentially, different findings may exist with different age categories.

Suggestions for additional areas of research to build upon the findings in this study include analyzing stock ownership with other types of trait combinations, examining how stock market volatility affects the association between personality and equity investing, and exploring how personality is associated with other types of investment vehicles. In this chapter, only three combinations of personality trait categories were examined (i.e., extroversion/openness, extroversion/agreeableness, and openness/agreeableness). Other types of combinations can be examined to explore how they influence stock ownership. Stock market volatility is another area that can be explored with personality and stock ownership. It would be of interest to examine how the association between personality and stock ownership potentially changes in different market environments (i.e., such as in volatile market conditions when compared to stable market conditions). A third potential research topic could examine the association with other types of savings and investing vehicles. Other types of financial vehicles that could be considered include residential home or other types of real estate investing, fixed income investing (i.e., bonds or fixed annuities), and precious metal investing (i.e., gold and silver). A fourth potential topic for research would be to explore that personality's association of with the amount of stocks a stock owner holds. Two approaches can be utilized. One approach could examine the total value amount of stock held and another approach could examine the ratio of stocks a stock owner has as a percentage of total net worth.

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Chapter 4 - Money as a Mediator between Personality and Life Satisfaction

Introduction

Happiness can be expressed as "how much one likes the life one lives" (Veenhoven, 2006, p45). In other words, happiness defines people's satisfaction with their lives. An important factor contributing to individuals' happiness is the presence of good living conditions. Money can impact the conditions people live in and experience. Money provides for people's ability to experience a better quality of life, and previous research has linked money to happiness as measured by life satisfaction (Diener & Biswas-Diener, 2002).

Soto and Luhmann (2013) summarized how money, represented by income, influenced life satisfaction by economic consumption and cognitive comparison. Greater incomes provide for greater opportunity to satisfy both basic needs, such as food and shelter (Diener, Ng, Harter, & Arora, 2010) as well as positive consumption experiences (Van Boven & Gilovich, 2003). Soto and Luhmann (2013) also noted that people compare their current income to others within their own social network. Boyce, Brown, and Moore (2010) had similar findings in that people's happiness was impacted not only by income, but was also impacted by their income rank within their own social group. Soto and Luhmann (2013) also identified that people make cognitive comparisons to their own past financial conditions.

Personality is another area that past research has found to be related to life satisfaction (Warner & Vromam, 2011; Albuquerque, Pedroso de Lima, Matos, & Fiqueiredo, 2012).

Personality is an outward representation of how people mentally process information (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Both the preference for a particular personality type (Harrington & Loffredo, 2001) and the intensity level of different personality traits (Weiss, Bates, & Luciano, 2008) have been found to be related with variations in life satisfaction. Personality has also been identified as influencing money in academic literature (Nyhus & Webley, 2001; Boyce & Wood, 2011; Harrison & Chudry, 2011). The purpose of this chapter's research was to examine the association between personality and life satisfaction with money as a mediating variable. The rest of this chapter is organized as follows: (a) literature review, (b) theoretical framework, (c) methodology, (d) results, (e) discussion, and (f) conclusion.

Literature Review

The relationship between personality and life satisfaction has been extensively documented in research literature (Harrington & Loffredo, 2001; Warner & Vromam, 2011; Albuquerque, Pedroso de Lima, Matos, & Fiqueiredo, 2012; Donnelly, Iyer, & Howell, 2012) as has been the relationship between money and life satisfaction (Easterlin, 2001; Diener & Biswas-Diener, 2002; Becchetti & Rossetto, 2009; Kahneman & Deaton, 2010). But, studies regarding how personality affects the association between money and life satisfaction are limited, and only recently have been examined (Borgjams, Duckworth, Heckman, & Ter Weel, 2008; Boyce & Wood, 2011; Proto & Rustichini, 2011; Donnelly, Iyer, & Howell, 2012). Furthermore, in money and life satisfaction studies, income has generally been used as a proxy for money. However, net worth has been identified as a potential alternative measure to use as a money variable (Headey, Muffles, & Wooden, 2008). The influence of net worth is discussed later in this section.

Money, as represented by income, has been identified as having a significant effect on happiness measures (Easterlin, 2001; Diener & Biswas-Diener, 2002). Diener and Biswas-Diener (2002) reviewed national data from the United States and other countries and concluded that income improved subjective well-being, but its impact on subjective well-being diminishes at higher income levels. Easterlin (2001) found similar results examining data from a U.S. Survey of 2,627 respondents. Both studies concluded that when people's income exceeded basic necessity levels, that income was less influential for increasing subject well-being because people's material desires would also increase accordingly. Diener and Biswas-Diener (2002) also suggested that at higher income levels, potential new desires may not be related to or resolved by higher incomes.

Addition of Personality into Money and Life Satisfaction Research

Recently, research literature has appeared examining the combination of personality and income in regards to life satisfaction (Boyce & Wood, 2011; Proto & Rustichini, 2011; Soto & Luhmann, 2013). Research in this area is relatively new and has been exploratory in nature rather than being theory driven. Examining data from the German Socio-Economic Panel, Boyce and Wood (2011) utilized a personality and income interaction regression approach to exam how these factors influenced life satisfaction. Their research offered no theoretical explanation, but found the Big Five traits of extroversion, openness, and neuroticism when interacted with income as being significant in influencing life satisfaction levels. Proto and Rustichini (2011) used data from both the German Socio-Economic Panel and the British Household Panel Survey for their study. Again, no theoretical base was identified as a framework for the study. However, rather than using a linear regression approach, they employed a quadratic regression technique to

create a best fit curved line. Their study found neuroticism as a significant trait when combined with income to influence life satisfaction.

Soto and Luhmann (2013) used national data from Germany, Britain, and Australia for their research. Their study moderated personality traits on income to examine the combined effects on life satisfaction. In moderation analysis, one independent variable (i.e., personality trait) interacts with another independent variable (i.e., income) to influence a dependent variable (i.e., life satisfaction). In their analysis, Soto and Luhmann (2013) found that neuroticism was a significant trait. They found that neuroticism moderated with household income influenced life satisfaction. Other personality traits had conflicting results across the various data sets. For example, the openness trait negatively moderated income on life satisfaction in the German data set, but positively moderated income in the Australian sample. A potential reason for this inconsistency may be the incorrect use of the moderation analysis technique. According to Hayes (2013), a moderating variable "is not a predictor variable in a moderation model" (p. 209), and has significance only in the presence of another independent variable. This is not the case with personality traits since personality has already been establish in past research as influencing life satisfaction (Harrington & Loffredo, 2001; Weiss, Bates, & Luciano, 2008; Warner & Vromam, 2011; Albuquerque, Pedroso de Lima, Matos, & Fiqueiredo, 2012). In situations like this, mediation analysis rather than moderation analysis may be more appropriate (Hayes, 2013).

Personality and Life Satisfaction

Harrington and Loffredo (2001) identified the Myers-Briggs personality preferences for extroversion, intuition, and judging types to be associated with high levels of psychological well-being and life satisfaction among college students. Using the Big Five traits, Weiss et al. (2008) found genetic factors relating to extroversion, conscientiousness, and neuroticism to significantly

influence subjective well-being among 973 adult twin pairs. Another study by Albuquerque et al. (2012) also found the same three Big Five traits (i.e., extroversion, conscientiousness, and neuroticism) to significantly influence the variance scores of subject well-being in primary and secondary school teachers.

Net Worth as an Alternative Proxy for Money

Research has also identified net worth as an alternative proxy for wealth (i.e., income has been used as a measure for wealth in past research) and as being associated with subjective well-being (Headey, Muffles, & Wooden, 2008). Money can store economic value, and net worth represents preserved past income that can be used for future use (Mitchell & Mickel, 1999). Hence, individuals with access to higher net worth levels may have higher satisfaction levels since they have greater access to stored wealth that may be used for future consumption activities and protect against economic uncertainties. This perspective is supported by research by Headey and colleagues (2008). Their research analyzed data collected from five countries (i.e., Australia, Britain, Germany, Hungry, and the Netherlands) and found net worth to be as strong a variable as income for influencing life satisfaction.

Other Demographic Variables

An exhaustive review of economic journals from 1990 to 2006 was conducted by Dolan, Peasgood, and White (2008) to identify variables influencing life satisfaction and happiness in past existing research. In addition to income and net worth, other common demographic variables consistent in their influence on satisfaction were age, gender, marital status, education, and race. Age generally has a U-shape relationship with happiness with level decreasing between 32 and 50. Females and married individuals generally report being happier than males and those unmarried. Education is also positively associated with happiness, and Blacks generally have the

lowest happiness and life satisfaction levels when compared to other races. Other demographic variables have also been found to influence life satisfaction, but with mixed results, and existing literature has generally consistently limited control demographic variables to age, gender, marital status, education, and race when examining the influence of money and personality with happiness measures (Easterlin, 2001; Diener & Biswas-Diener, 2002; Weiss, Bates, & Luciano, 2008; Boyce, Brown, & Moore, 2010; Diener, Ng, Harter, & Arora, 2010; Boyce & Wood, 2011; Donnelly, Iyer, & Howell, 2012; Soto & Luhmann, 2013).

Theoretical Framework

Chapters Two and Three provided a detailed explanation of psychological type theory. In short, psychological type theory puts forward that personality is an outward reflection of how people prefer to mentally accept information, focus their attention, and process decisions, which in turn, leads to variations in preference outcomes and behaviors (Jung, 1971; Briggs Myers, McCaulley, Quenk, & Hammer, 2009). The theoretical framework used in this chapter is called the doctrine of interactionism and extends the constructs of personality theory (Bowers, 1973). The doctrine of interactionism acknowledges the existing association between personality traits and behavioral outcomes, but it builds upon the personality theory by incorporating an intervening variable between the trait and behavior relationship (Bowers, 1973; Kihlstrom, 2013).

The doctrine of interactionism posits that, in addition to traits, situation specific circumstances affect people's behavior outcomes (Bowers, 1973). Furthermore, the situation specific circumstances that individuals find themselves in may be the product of their own

actions based upon the view that people can shape their own environments (Kihlstrom & Harackiewicz, 1990). This theory is graphically represented in Figure 4.1.

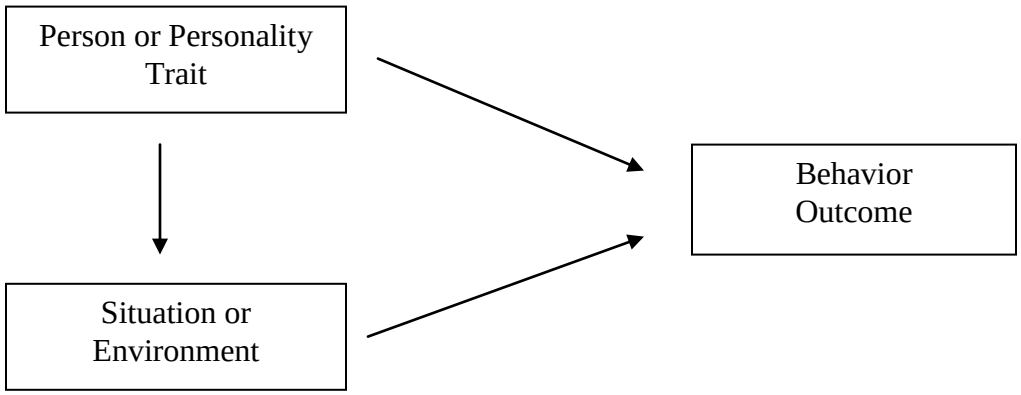


Figure 4.1. Doctrine of Interaction Schematic Diagram (adpated from Kihlstrom, 2013)

As depicted in Figure 4.1, personality traits affect both behavior outcome and one's environment or one's current situation, which in turn also affects one's outcome (Bowers, 1973; Kihlstrom & Harackiewicz, 1990; Kihlstrom, 2013). The doctrine of interactionism provided the framework for the research goal in this chapter. Utilizing associations established in past research and the theoretical framework provided by the doctrine of interactionism, this chapter's research question could be analyzed. Specifically, the research question examined was "How does money expressed by net worth and income mediate the association between personality traits and life satisfaction?" The Big Five personality system (i.e., extrovert scale, openness scale, agreeableness scale, conscientiousness scales, and neuroticism scale) was used to represent personality traits in this chapter's analysis.

Past research reviewed in the literature review section confirms three associations relevant to this chapter's analysis that can be incorporated into the doctrine of interactionism. The first is an association between personality and life satisfaction (Harrington & Loffredo,

2001; Weiss, Bates, & Luciano, 2008). This association can represent the trait to behavior connection within the doctrine theory. The second association is one between personality and financial outcomes such as income and net worth. Existing research studies have identified an association between personality and income (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Viinikainen, Kokko, Pulkkinen, & Pehkonen, 2010). Furthermore, in Chapter Two, regression analysis results support a relationship between personality and net worth. This association can represent the trait to situation connection within the doctrine of interactionism. The third association is between income and net worth with life satisfaction (Easterlin, 2001; Diener & Biswas-Diener, 2002; Headey, Muffles, & Wooden, 2008; Diener, Ng, Harter, & Arora, 2010). This association can represent the situation to behavior connection within the doctrine of interactionism framework.

Although individual associations among personality, money (i.e., income and net worth), and life satisfaction have been studied; however, research examining these relationship together collectively is limited (Soto & Luhmann; 2013). Utilizing the doctrine of interaction theory as a framework to examine the relationship among these three variables, the hypotheses listed below were examined. The research in this study is exploratory in nature and represented unexplored territory among the variables of personality, money, and life satisfaction.

Hypothesis 1: An association between the extroversion personality trait and life satisfaction is mediated by income and net worth.

Hypothesis 2: An association between the openness personality trait and life satisfaction is mediated by income and net worth.

Hypothesis 3: An association between the agreeableness personality trait and life satisfaction is mediated by income and net worth.

Hypothesis 4: An association between the conscientiousness personality trait and life satisfaction is mediated by income and net worth.

Hypothesis 5: An association between the neuroticism personality trait and life satisfaction is mediated by income and net worth.

Methodology

Data and Sample

This study utilized core survey and Psychosocial Lifestyle Questionnaire data from the 2010 panel of the Health and Retirement Study (HRS). The HRS dataset is a national longitudinal survey conducted by the Survey Research Center at the University of Michigan and funded by the National Institute on Aging and the Social Security Administration. The design objective of the HRS is to (a) explain the antecedents and consequences of retirement; (b) examine health, income, and wealth relationships over time; (c) examine life cycle wealth accumulation and consumption patterns; (d) monitor disability from work; and (e) examine how economics, family, and program resources affect retirement, dis-savings, health declines, and institutionalizations (National Institutes of Health, 2007).

Each household in the HRS data file contained one individual who was identified as the financial respondent and who was responsible for answering the HRS financial questions (RAND Center for the Study of Aging, 2011). This study selected only financial respondents to be included for analysis purposes. A second survey called the Psychosocial and Lifestyle

Questionnaire was provided to 50% of the respondents that were randomly selected after core HRS data was collected (Smith, Fisher, Ryan, Clarke, House, & Weir, 2013). The Psychosocial and Lifestyle Questionnaire was a paper survey that respondents were asked to complete and return by mail. This written questionnaire was completed by 5,402 financial respondents in 2010. The total size of the sample population used in this study was 4,586 which represented financial respondents who had sufficiently completed the demographic, life satisfaction, and personality traits questions sufficiently to be included in this analysis. Based upon complex sampling procedures, the 4,586 respondents when weighted were designed to represent a total of 22,228,439 individuals.

Variables

The variables included for analysis along with their respective measurement units are identified in Table 4.1. The dependent variable was life satisfaction, which was measured with a seven-point Likert scale. In the HRS survey data set, respondents were asked to rate five life satisfaction statements from one to seven based upon how well they personally agreed with each statement (Smith, Fisher, Ryan, Clarke, House, & Weir, 2013). These statements included: (a) in most ways my life is close to ideal; (b) the conditions of my life are excellent; (c) I am satisfied with my life; (d) so far, I have gotten the important things I want in life; and (d) if I could live my life again, I would change almost nothing. The responses to these questions were then averaged to create a life satisfaction score. Scores, ranging from one to seven, were calculated as long as least three of the five life satisfaction statements were answered with higher scores indicating higher levels of life satisfaction. The Cronbach's alpha score for the life satisfaction scale was calculated as .89. Cronbach's alpha is used to measure scale reliability with preferred scores at .70 or higher (Field, 2013).

Table 4.1

Measurement of Dependent and Independent Variables

Variables	Measurement
Dependent Variable	
Life satisfaction	Scale between 1 to 7 (higher numbers represent higher satisfaction levels)
Independent Variables	
Extroversion	Scale between 1 to 4 (the higher the number, the stronger the trait)
Conscientiousness	Scale between 1 to 4 (the higher the number, the stronger the trait)
Openness	Scale between 1 to 4 (the higher the number, the stronger the trait)
Agreeableness	Scale between 1 to 4 (the higher the number, the stronger the trait)
Neuroticism	Scale between 1 to 4 (the higher the number, the stronger the trait)
Gender and Marital Status	
Single male	Used as reference category
Single female	1 for single female; 2 otherwise
Married male	1 for married male; 2 otherwise
Married female	1 for married female; 2 otherwise
Age	
50-59	Used as reference category
60-69	1 if respondent reported age between 60 to 69; 2 otherwise

Variables	Measurement
70-79	1 if respondent reported age between 70 to 79; 2 otherwise
80 plus	1 if respondent reported age between 80 or above; 2 otherwise
Hispanic	
Hispanic	1 if respondent reported as Hispanic; 2 otherwise
Race	
White	Used as reference category
Black	1 if respondent reported as Black; 2 otherwise
Other	1 if respondent reported as other; 2 otherwise
Education Level	
Less than High school	Used as reference category
High school or GED	1 if respondent reported highest level of education as either high school diploma or GED; 2 otherwise
Some college	1 if respondent reported highest level of education as some college; 2 otherwise
Bachelor's degree	1 if respondent reported highest level of education as bachelor's degree; 2 otherwise
Post-graduate degree	1 if respondent reported highest level of education as a post-graduate degree; 2 otherwise
Mediating Variables	
Log household income	Continuous, one was added to zero and positive household income then logged

Variables	Measurement
Log household net worth	Continuous, one was added to zero and positive household income then logged

Independent variables included personality types, which were measured using personality trait scale scores. McCrae and Costa (1989; 2006) proposed using The Big Five personality traits as potential measurement variables to represent psychological personality type. In the HRS survey, respondents were asked to rate 31 words from one to four based upon how well the words described themselves. Each word was an adjective associated with one of The Big Five personality traits. Responses were organized and used to calculate scores for the extroversion, openness, agreeableness, conscientiousness, and neuroticism personality traits. A detailed review for the method for creating these personality trait scale scores is documented in Chapter Two. The Cronbach's alpha scores were .75 for extroversion, .79 for agreeableness, .68 for conscientiousness, .80 for openness, and .71 for neuroticism. As mentioned previously, Cronbach's alphas score above .70 are preferred for scale reliability purposes; however, scores slightly below .70 are generally deemed acceptable (Field, 2013).

Additional independent variables included both control variables and mediating variables. The control variables used in this study included gender, marital status, age, race, and education. Money represented by both net worth and income was used as mediating variables, which is further discussed in the next section under conceptual model. The expected relationship between the dependent and independent variables are listed in Table 4.2. These expected relationship are based upon past research literature.

Table 4.2

Expected Relationship between Independent Variables and Dependent Variable (Life Satisfaction)

Independent variable	Effect on dependent variable (life satisfaction)
Gender (male)	+
Age	-
Race (White)	+
Race (Black)	-
Education	+
Marital status (married)	+
Household income	+
Household net worth	+
Extroversion	+
Conscientiousness	None
Openness	+
Agreeableness	None
Neuroticism	-

Conceptual Model

The conceptual model utilized in this chapter was based on mediation analysis. As shown in Figure 4.2, an independent variable can influence a dependent variable though a single path (identified as path *c* in the diagram). In, mediation analysis, path *c* is called the total effect (Jose, 2013).

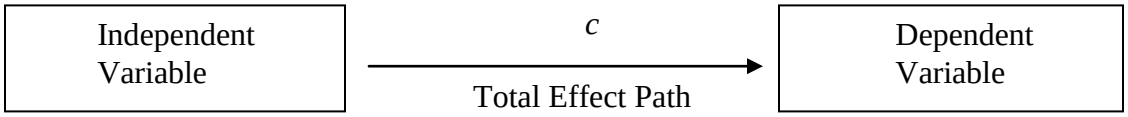


Figure 4.2. Conceptual Model for a Simple Relationship between Two Variables

Based upon mediation analysis, an independent variable influences a dependent variable in multiple routes (Field, 2013; Hayes, 2013; Jose, 2013). As shown in Figure 4.3, the independent variable influences the dependent variable directly. This direct influence is called the direct effect and is shown as path c^1. In addition, the independent variable also influences the independent variable through an intervening variable. The intervening variable is called the mediating variable. In Figure 4.3, this is illustrated by the independent variable influencing the mediating variable through path *a* and the mediating variable influencing the dependent variable through path *b*. This path through *a* and *b* is called the indirect effect. The relationship between the simple relationship model and the simple mediation is such that the total effect of the independent variable on the dependent variable is equal to the sum of the direct and indirect effects by the independent variable on the dependent variable. Expressed mathematically, $c = c' + ab$.

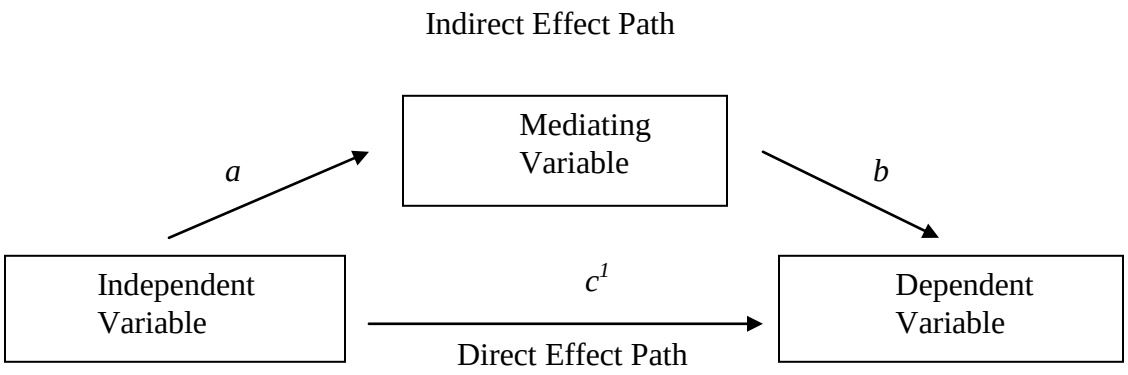


Figure 4.3. Simple Mediation Conceptual Model

In the mediation example in Figure 4.3, four regression models are completed. These regressions include: (a) a total effect model representing the relationship between the independent variable and dependent variable without any intervening mediating variable (i.e., the relationship identified as path *c* in Figure 4.2); (b) a direct effect model of representing the relationship between the independent variable and dependent variable in the presence of a mediating variable (i.e., path c^1 in Figure 4.3); (c) a model representing the relationship between the independent variable and the mediating variable (i.e., path *a* in Figure 4.3); and (d) a model representing the relationship between the mediating variable and the dependent variable (i.e. path *b* in Figure 4.3).

It is possible for mediation analysis to include more than one intervening mediating variable (Hayes, 2013; Jose 2013). For example, in Figure 4.4, the initial independent variable affects the dependent variable directly (i.e., path c^1) and indirectly through two intervening variables (i.e., paths a_1b_1 and a_2b_2). According to Hayes (2013), a multiple mediation model has more benefit for understanding an independent variable's effects on a dependent variable compared to conducting a simple mediation model multiple times with different individual

mediating variables. For analysis purposes, additional regression calculations are completed to account for the additional paths that result from the inclusion of the additional mediating variable (i.e., path a_2b_2). For a two mediating variable model, the relationship between the simple relationship model and a two variable mediator model is $c = c' + a_1b_1 + a_2b_2$.

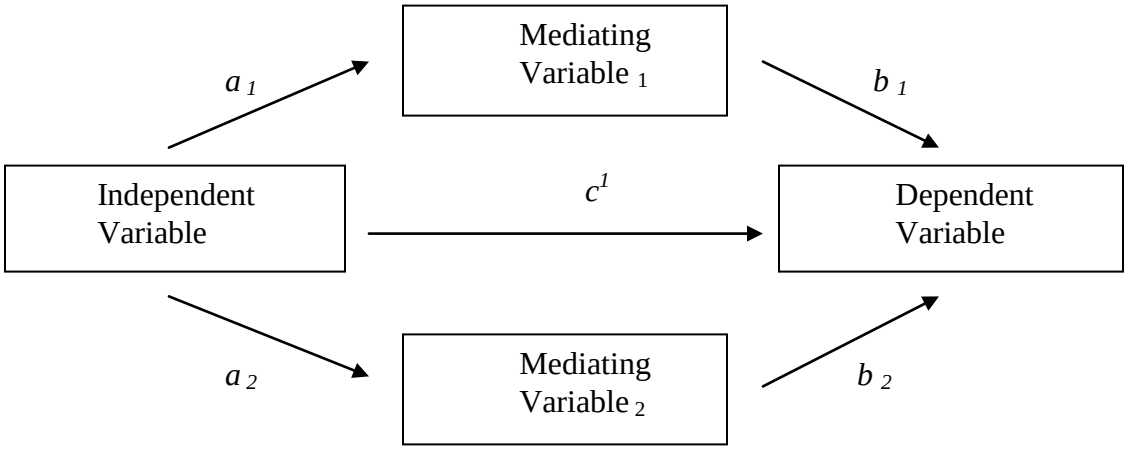


Figure 4.4. Multiple Mediation Conceptual Model Example

Statistical Analysis

In mediation analysis, the conceptual model and the statistical model are mostly the same (Field, 2013; Hayes, 2013). Figures 4.5 and 4.6 identify the mediation analysis for this chapter with the variables of interest for analysis. One difference between the conceptual and statistical models is that in the statistical model, the coefficients c, a_1, b_1, a_2, b_2, and c^1 represent the unstandardized regression coefficients of the independent variables in addition to the paths between variables. For example, in Figure 4.6, a_1 is the unstandardized coefficient of a personality trait variable in a regression model between personality and one of the mediating money variables (i.e., net worth).

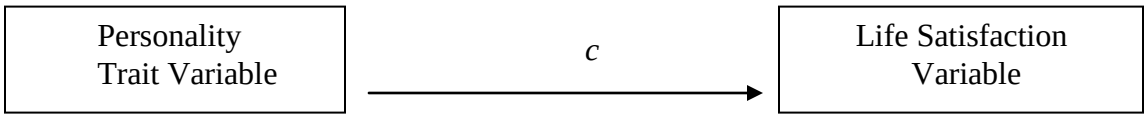


Figure 4.5. Statistical Model for a Simple Relationship between Money and Subjective Well-Being

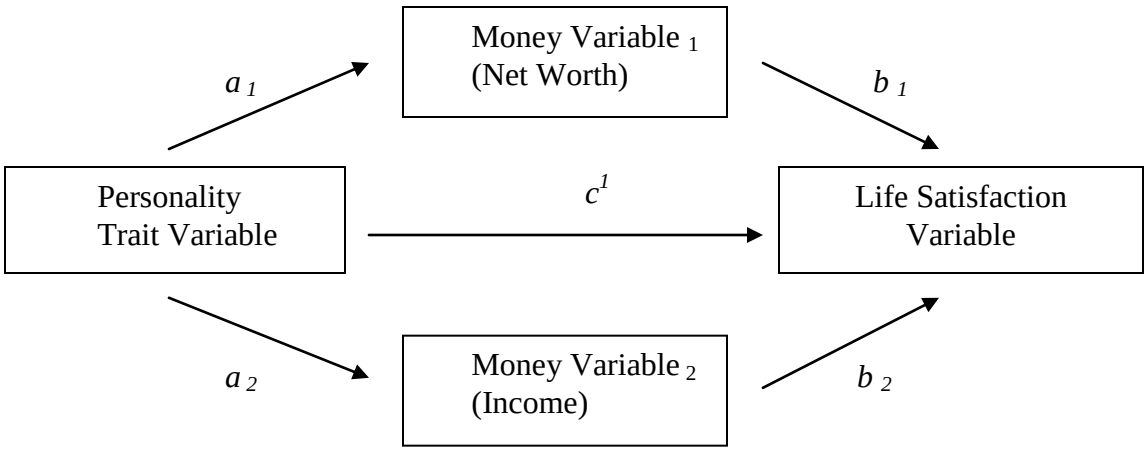


Figure 4.6. Statistical Mediation Model between Personality and Subjective Well-Being Mediated by Two Money Variables

In the mediation analysis for this study, regression computations were calculated for all paths in Figures 4.5 and 4.6 (i.e., c, a_1, b_1, a_2, b_2, and c^1). For example, R^2 and F-test values are examined to determine the strength and significance of the individual regression models, and t-tests are used to examine the significance of the independent variables of interest along with calculations of the 95% confidence interval range of the coefficient values. Examination of the coefficient values' 95% confidence range is of particular importance. This range identifies the minimum and maximum values of the coefficient. A coefficient value of zero for the

independent variable means the variable has no effect on the dependent variable. Hence, it is important when examining the 95% confidence interval range to note if zero is present in the range.

The complex samples analysis was used to account for the complex sampling design of the HRS data set. Complex sampling procedures weigh observation values differently based upon data stratification from no-overlapping segments, data clustering from similar segments, and weight functions due to unequal selection probabilities (Aneshensel, 2013). Data sets that use complex sample designs should also use complex sample analysis procedures to reduce the chance of Type I errors (Heeringa & Connor, 1995; National Institutes of Health, 2007, Neilsen, Davern, Jones Jr., & Boies, 2009; Aneshensel, 2013). Complex sample analysis yields parameter estimates and calculates standard error values.

Results

Descriptive Statistics

Descriptive statistics results are listed in Table 4.3. There were 4,586 respondents include in the analysis. In terms of gender and marital status, respondents were well represented in each category. Single males and single females represented 14.57% and 29.72% of the respondents, while married males and married females accounted for 34.80% and 20.91% of the respondents, respectively. Age categories also were well represented in each category. Those ages 50 to 59 represented 32.49% of respondents, ages 60 to 69 represented 33.28% of respondents, ages 70 to 79 represented 20.48% of respondents, and age 80 and above represented 13.75% of respondents. In the race category, Whites accounted for the majority of the sample at 90.01%, while Blacks accounted for only 7.20%, and other races accounted for only 2.77%. Only a

minority of respondents were Hispanic (4.96%). Most respondents' highest education level achieved were at the high school/GED level at 54.03%, while only 9.71% did not complete high school. As far as college, 6.40% attended college without graduation, 17.51% graduated, and an additional 12.90% had graduate degrees.

The dependent variable was life satisfaction, and the average life satisfaction score was 4.8613 for the sample population (i.e., based upon a seven-point Likert scale). Married individuals generally had higher life satisfaction scores than those who were unmarried. The average scores for married men and women were 5.1059 and 5.1364, respectively, while the average score for single men and women were 4.4207 and 4.5972, respectively. The age category from 70 to 79 had the highest average life satisfaction score of 4.9911. Those ages 80 and above had an average score of 4.9798, and those from ages 60 to 69 had an average score of 4.9129. Those ages 50 to 59 had the lowest average score at 4.6765. The average scores of those with college degrees (5.1476) and graduate degrees (5.3033) were higher than other education categories (i.e., the less then high school category average score was 4.6640, the high school/GED category average score was 4.7133, and the some collage category average score was 4.7190). Hispanic respondents' average life satisfaction score was 4.5981. Finally, Whites had an average score of 4.8950 while Blacks and other races averaged 4.4659 and 4.7819, respectively.

As for other descriptive data, $167,456 was the average household net worth, and $45,593 was the average household income. Five personality traits were measured using a four-point Likert scale. The average respondent score for extroversion was 3.1573. The average respondent score for conscientiousness was 3.2766. The openness average score was 2.9513,

while the agreeableness average score was 3.4763. The average score for the final personality trait of neuroticism was 2.0001.

Table 4.3

Descriptive Statistics

Variable	Mean or Percent	Weighted Mean Life Satisfaction
Life satisfaction	4.8613(scale between 1 to 7)	
Single male	14.57%	4.4207
Single female	29.72%	4.5972
Married male	34.80%	5.1059
Married female	20.91%	5.1364
Age Category		
Age 50-59	32.49%	4.6765
Age 60-69	33.28%	4.9129
Age 70-79	20.48%	4.9911
Age 80 plus	13.75%	4.9798
Hispanic ethnicity	4.96%	4.9581
White race	90.01%	4.8950
Black race	7.20%	4.4659
Other race	2.77%	4.7819
Education Category		
Less than high school	9.17%	4.6640

Variable	Mean or Percent	Weighted Mean Life Satisfaction
High school or GED	54.03%	4.7133
Some college	6.40%	4.7190
College graduate	17.51%	5.1476
Post-graduate degree	12.90%	5.3033
Log household income	4.6589 ($45,593)	
Log net worth	5.2239 ($167,456)	
Extroversion	3.1573 (scale between 1 to 4)	
Conscientiousness	3.2766 (scale between 1 to 4)	
Openness	2.9513 (scale between 1 to 4)	
Agreeableness	3.4763 (scale between 1 to 4)	
Neuroticism	2.0001 (scale between 1 to 4)	

N = 4,586

Regression Result Organization

Regression results for this mediation study are reported under three sections. Each section represents a different component within the mediation analysis. First, the total effect regression results represent findings pertaining to a simple relationship model between the independent variables and the dependent variable (i.e., the *c* path in Figure 4.1). Second, the direct effect and, third, the indirect effect regression results represent paths within a model with mediating variables (i.e., the c^1 path for direct effect plus the a_1b_1 and a_2b_2 paths for the indirect effect in Figure 4.3).

Analysis Results (Total Effect)

The results from the total effect analysis, as shown in Table 4.4, identify which of the individual personality traits were found as significantly associated with life satisfaction. Total effect analysis represents the association between the independent variables (i.e., personality traits) and the dependent variable (i.e., life satisfaction) without the presences of any mediating variables (i.e., household net worth and household income). Three personality traits were identified as significant. The extroversion trait and conscientiousness trait were positively related to a higher life satisfaction score, while the neuroticism trait was negatively associated with life satisfaction scores. The beta coefficient calculated for the extroversion trait was .623. This conveys that a one-unit change in the extroversion variable was associated with a .623 change in the life satisfaction variable score, holding all else equal. The beta coefficients for the conscientiousness and neuroticism variables were .288 and -.606, respectively. The two remaining personality traits of agreeableness and openness were not found to be significantly associated with life satisfaction. These relationships are depicted graphically in Figures 4.7 to 4.11, and a more detailed review regarding these findings is provided in the discussion section.

As far as the control variables, being married, age categories, and education level were consistent with past research by being positively associated with life satisfaction (Dolan, Peasgood, & White, 2008). Both the variables for married males (beta of .465) and married females (beta of .588) were positively associated with life satisfaction. For both age category and education level, as these variable categories increased so did their beta coefficient values increase, holding all else equal. For example, the beta coefficients for the age category variables were .179 for ages 50 to 50, .247 for ages 60 to 69, .487 for ages 80 and above, when using ages 50 to 59 as the reference category (i.e., all at $p < .01$). Education category beta coefficient scores

were significant for both college graduates (i.e., .245 at $p < .05$) and post-graduate degree respondents (i.e., .402 at $p < .01$).

The Black race variable beta coefficient was calculated as .349, and was positively associated with life satisfaction. This finding was different from past research, which had identified this variable as being negatively associated with life satisfaction (Dolan, Peasgood, & White, 2008). A potential explanation for this difference may be that the respondents in this study were limited to those ages 50 and above, while past research included all age ranges. Additional research in this area is warranted to further explore the reason for this difference.

Table 4.4

Linear Regression Coefficients and Standard Errors for the Total Effect Association between Personality Traits (Independent Variable) and Life Satisfaction (Dependent Variable)

Variable	*B*	*SE*
Single male (reference group)		
Single female	-.016	.084
Married male	.465**	.092
Married female	.588**	.100
Age 50 to 59 (reference group)		
Age 60 to 69	.179**	.061
Age 70 to 79	.247**	.060
Age 80 plus	.487**	.067
Hispanic ethnicity	.193	.135

Variable	*B*	*SE*
White race (reference group)		
Black race	.349**	.069
Other race	-.007	.140
No GED/High school (reference group)		
GED/High school	-.050	.090
Some college	.007	.096
College graduate	.245*	.104
Post-graduate degree	.402**	.107
Extroversion	.623**	.056
Agreeableness	-.081	.061
Conscientiousness	.288**	.064
Openness	.007	.057
Neuroticism	-.606**	.049
R^2	.215	

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

N=4,586

Analysis Results (Mediation Model)

Direct effect. The direct effect identifies the association between the independent variables (i.e., personality traits) and the dependent variables (i.e., life satisfaction) in the presence of any mediating variables (i.e., household net worth and household income). The results of the direct effect analysis are shown in Table 4.5. In this analysis, both extroversion

(Beta of .582) and conscientiousness (Beta of .236) were significantly shown as being positively associated with life satisfaction, while neuroticism (Beta of -.58) was significantly shown as being negatively associated with life satisfaction, holding all else equal. The other two personality traits, agreeableness and openness, are not significantly related to life satisfaction. These findings were similar to those results in the total effect analysis.

Table 4.5

Linear Regression Coefficients and Standard Errors for the Direct Effect Association between Personality Traits (Independent Variable) and Life Satisfaction (Dependent Variable)

Variable	*B*	*SE*
Single male (reference group)		
Single female	.007	.084
Married male	.289**	.092
Married female	.425**	.099
Age 50 to 59 (reference group)		
Age 60 to 69	.149**	.059
Age 70 to 79	.214**	.060
Age 80 plus	.448**	.072
Hispanic ethnicity	.321*	.145
White race (reference group)		
Black race	-.181*	.072

Variable	*B*	*SE*
Other race	.030	.147
No GED/High school (reference group)		
GED/High school	-.204*	.083
Some college	-.194*	.090
College graduate	-.067	.097
Post-graduate degree	.064	.101
Log HH income	.258**	.078
Log HH net worth	.277**	.040
Extroversion	.582**	.056
Agreeableness	-.031	.061
Conscientiousness	.236**	.060
Openness	-.043	.050
Neuroticism	-.585**	.051
R^2	.239	

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

N=4,586

Indirect effect. Two other coefficients that are important to note in Table 4.5 are the beta coefficients for log net worth (.277) and log income (.258). These coefficients were both significant at $p < .01$. They represent the b_1 coefficient (i.e., for net worth mediator variable) and the b_2 coefficient (for income mediator variable) in the indirect effect paths.

The results regarding the relationship between personality traits and the two mediating variables (household income and household net worth) are presented in Tables 4.6 and 4.7, respectively. In Table 4.6, three personality traits are significantly associated with household income. These include extroversion (.035 coefficient), openness (.047 coefficient), and neuroticism (-.035 coefficient). However, in Table 4.7, all five personality traits were identified as significantly associated with net worth. The traits of extroversion (.114 coefficient), conscientiousness (.190 coefficient), and openness (.086 coefficient) were positively associated with life satisfaction, while the agreeableness (-.159 coefficient) and neuroticism (-.043 coefficient) traits were negatively associated with life satisfaction, holding all else equal. (Note: these findings are different from those in Chapter Two which performed a similar analysis because household income was not used as a control variable in the indirect effect regression analysis between personality traits and household net worth in this regression. For mediation analysis purposes, parallel mediating variables are not used as control variables in calculating significance for other alternative parallel mediating variables.) Figures 4.7 to 4.11 show graphically the mediation models representing the relationship between the different personality traits and life satisfaction as mediated by both household net worth and household income. These models are reviewed more fully in the next section that follows.

Table 4.6

Linear Regression Coefficients and Standard Errors for the Indirect Path using Income as Mediator between Personality Variables and Life Satisfaction

	Log Household Income as a Mediator Variable (path a_2)	
Variable	*B*	*SE*
Single male (reference group)		
Single female	-.057*	.023
Married male	.294**	.022
Married female	.274**	.024
Age 50 to 59 (reference group)		
Age 60 to 69	-.071**	.020
Age 70 to 79	-.143**	.018
Age 80 plus	-.195**	.021
Hispanic ethnicity	-.151**	.051
White race (reference group)		
Black race	-.146**	.023
Other race	-.051	.046
No GED/High school (reference group)		
GED/High school	.178**	.024
Some college	.237**	.041
College graduate	.371**	.030

Variable	Log Household Income as a Mediator Variable (path a_2)	
	B	*SE*
Post-graduate degree	.464**	.028
Extroversion	.035*	.016
Agreeableness	-.027	.015
Conscientiousness	-.003	.022
Openness	.047**	.013
Neuroticism	-.035*	.013
R^2	.369	

*p < .05. **p < .01

N=4,586

Table 4.7

Linear Regression Coefficients and Standard Errors for the Indirect Path using Net Worth as Mediator between Personality Variables and Life Satisfaction

Variable	Log Household Net Worth as a Mediator Variable (path a_1)	
	B	*SE*
Single male (reference group)		
Single female	-.030	.047
Married male	.359**	.049

Variable	Log Household Net Worth as a Mediator Variable (path a_1)	
	B	*SE*
Married female	.331**	.046
Age 50 to 59 (reference group)		
Age 60 to 69	-.187**	.032
Age 70 to 79	.252**	.049
Age 80 plus	.323**	.045
Hispanic ethnicity	-.321**	.086
White race (reference group)		
Black race	-.471**	.049
Other race	-.088	.081
No GED/High school (reference group)		
GED/High school	.391**	.053
Some college	.502**	.069
College graduate	.778**	.058
Post-graduate degree	.786**	.065
Extroversion	.114**	.030
Agreeableness	-.159**	.029
Conscientiousness	.190**	.033
Openness	.086**	.035
Neuroticism	-.043*	.021

	Log Household Net Worth as a Mediator Variable (path a_1)	
Variable	*B*	*SE*
R^2	.255	

*p < .05. **p < .01

N=4,586

Discussion

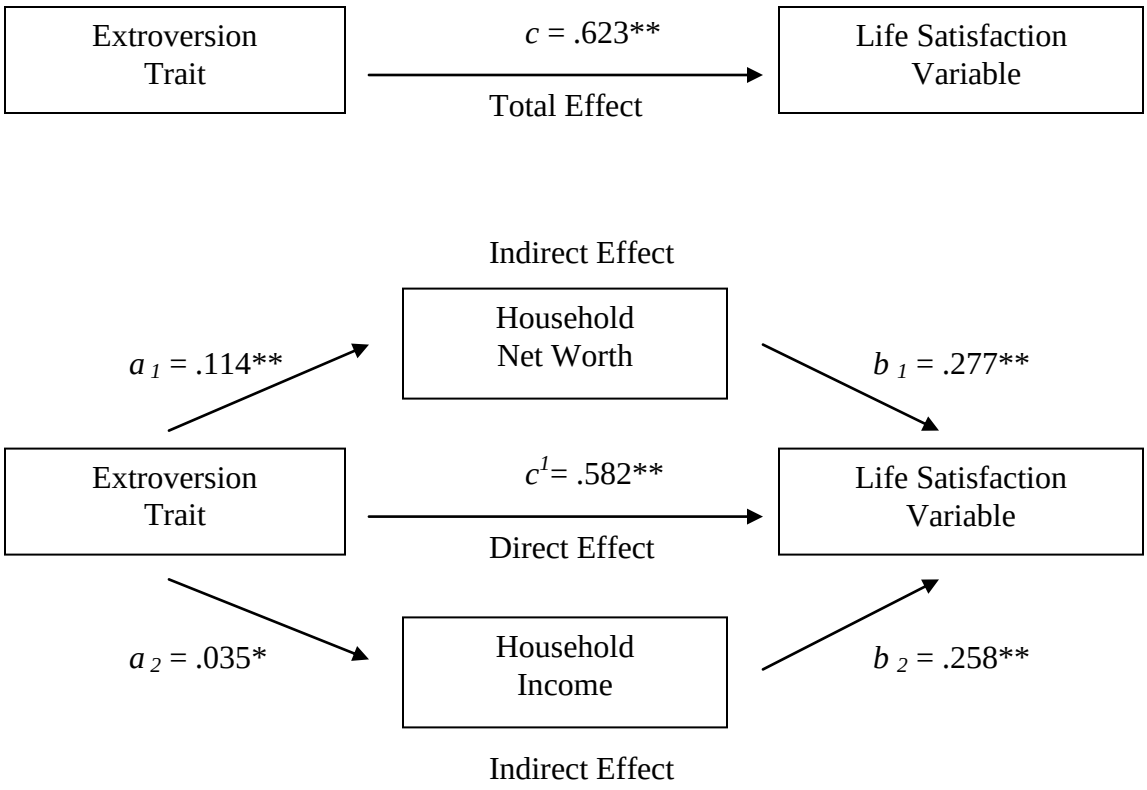
The purpose of this research study was to explore the mediating influence that money, namely through net worth and income, has on the relationship between personality and life satisfaction. To guide this analysis, individual hypotheses were developed for five different personality trait types. The findings in this study contributes to the research field both by confirming past research results and by producing results that potentially support additional perspectives for understanding the relationships between personality, money, and life satisfaction.

The first hypothesis tested to see if money, represented by net worth and income, influenced the relationship between the extroversion personality trait and life satisfaction. An examination of coefficients and paths significance (as seen in Figure 4.7) provides support for this hypothesis. In Figure 4.7, all paths are significant, supporting a relationship between variables which is an important criterion for a mediation relationship. Furthermore, the *c'* coefficient in the direct effect path is smaller than the *c* coefficient in the total effect path, confirming the existence of a mediating variable (Jose; 2013). However, an examination of the *c* and *c'* coefficient values (i.e., *c* equals .623 and *c'* equals .582) conveys the mediating effect by

net worth and income between the extroversion variable and life satisfaction as small because the difference between *c* and *c'* is small.

Other information that can be derived from the analysis results depicted in Figure 4.7 is that all the coefficients are positive, meaning a positive relationship exists between variables. Also the coefficient values imply the degree of influence the mediating paths have. For example, it appears that because coefficients in the net worth indirect path route are larger than the coefficients in the income indirect path route, a change in values in net worth would have a greater influence on life satisfaction than a change in income (i.e., both net worth and income are measured in same units, log dollars).

Interpreting the results from a doctrine of interaction theory lens, the findings would convey that one's individual extroversion personality trait level is associated with one's environmental situation expressed by an individual's net worth and income circumstances and, in turn, one's life satisfaction level.



Whereas, $c = c' + a_1b_1 + a_2b_2$ (i.e., .623 = .582 + (.114) (.277) + (.035) (.258) accounting for rounding error).

Path Significant

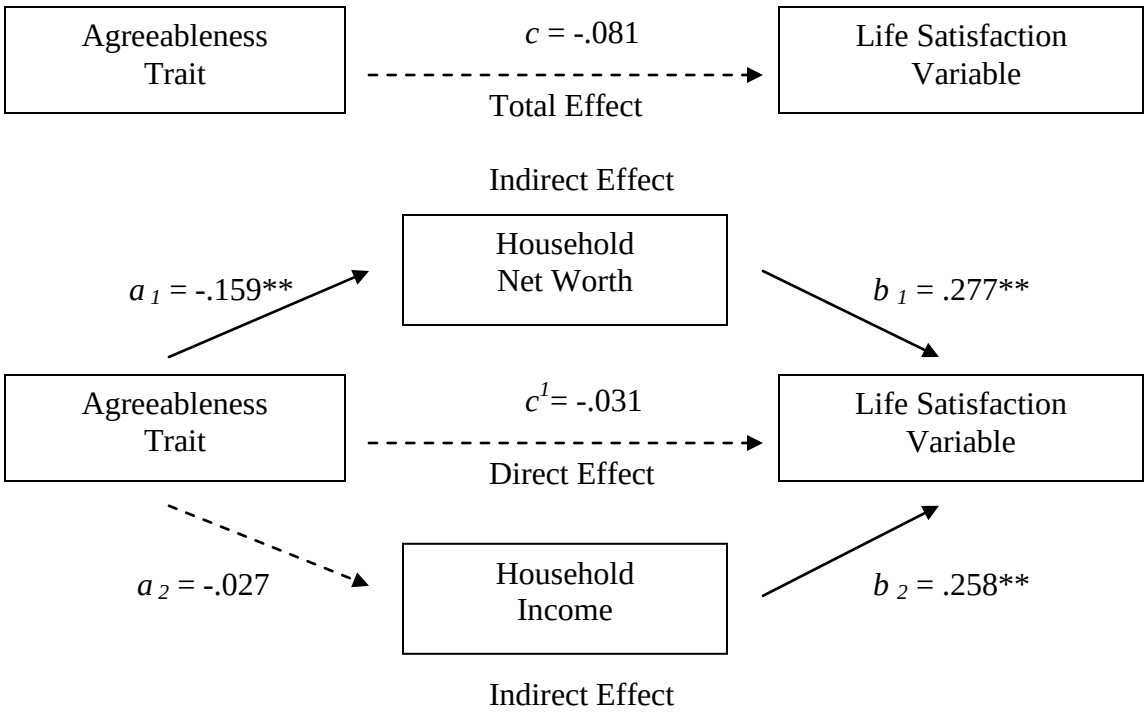
Path Not Significant

Figure 4.7. Mediation Model between Extroversion and Life Satisfaction as Mediated by Net Worth and Income

The second hypothesis proposed that money mediates the association between the agreeableness personality trait and life satisfaction. As shown in Figure 4.8, the results of this study do not support a mediation relationship. Specifically, both the paths *c* and *c'* are not significant, and these paths would need to be significant for a mediating relationship to exist.

From a doctrine of interaction theory perspective, the findings do not support one's individual agreeableness personality trait level as being associated with one's life satisfaction level through one's environmental situation as expressed by an individual's net worth and income circumstances.

However, the findings of this analysis may provide support for a moderation relationship between the agreeableness trait and life satisfaction. In moderation modeling, a moderation relationship exists when an independent variable is associated with a dependent variable only while interacting with another independent variable (Field, 2013; Jose, 2013; Hayes 2013). Directly, the agreeableness trait was not significantly associated with life satisfaction; however, the analysis found that the agreeableness variable was significantly associated with net worth, and net worth was significantly associated with life satisfaction. Additional research examining how an agreeableness/net worth interaction relationship may be associated with life satisfaction is warranted.



Whereas, $c = c' + a_1b_1 + a_2b_2$ (i.e., -.081 = -.031 + (-.159) (.277) + (-.027) (.258) accounting for rounding error).

Path Significant

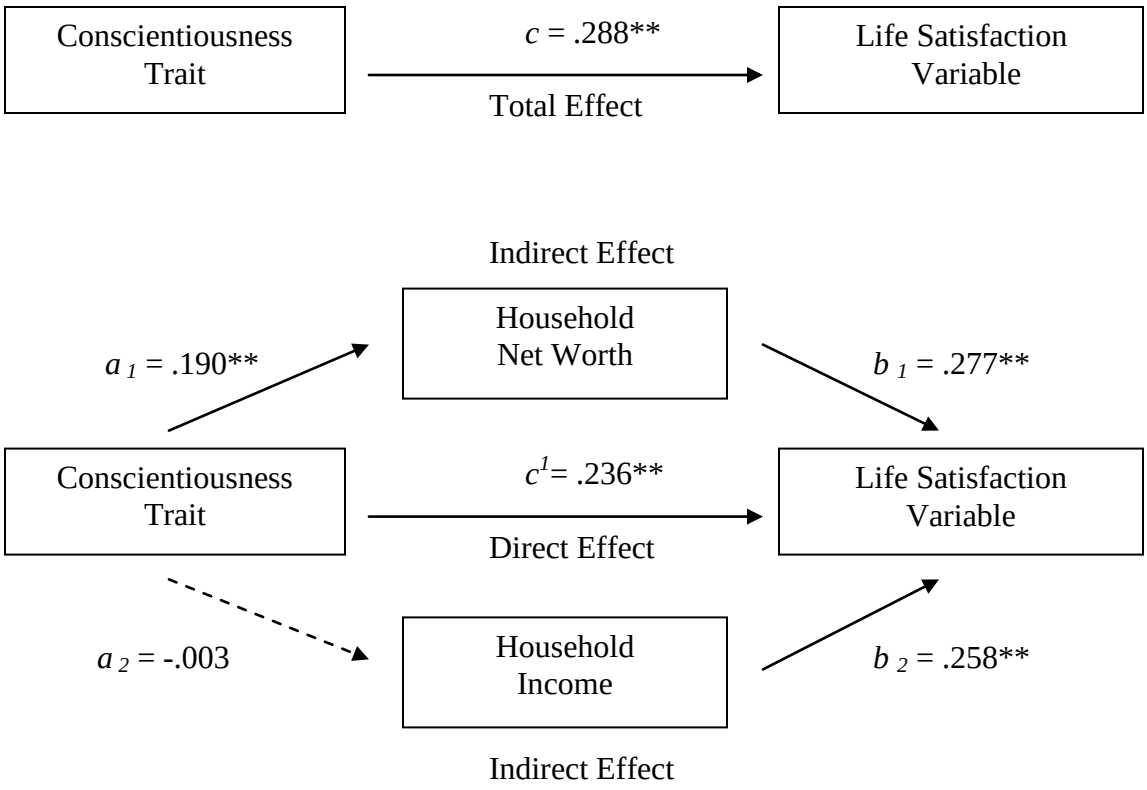
Path Not Significant

Figure 4.8. Mediation Model between Agreeableness and Life Satisfaction as Mediated by Net Worth and Income

The third hypotheses proposed money to mediate the relationship between the conscientiousness personality trait and life satisfaction. Support for this hypothesis was found in this study. A number of noteworthy findings are shown in Figure 4.9. First, a significant positive relationship between the conscientiousness trait and life satisfaction exist in the total effect and direct effect models. This result is consistent with academic literature and supports past research

(Weiss, Bates, & Luciano, 2008; Albuquerque, Pedroso de Lima, Matos, & Fiqueiredo, 2012). A second finding depicted in Figure 4.9 involves the significance of only the net worth indirect path, while the income indirect path was identified as non-significant. This finding communicates support that money does mediate between the conscientiousness trait and life satisfaction, but only by net worth and not income.

From a doctrine of interaction theory lens, the findings would convey that one's individual conscientiousness trait level is associated with one's environmental situation via individual net worth and, in turn, one's life satisfaction level. However, an examination of *c* and *c'* coefficient values (i.e., *c* equals .288 and *c'* equals .236) conveys that the mediation effect is small since the difference between these two values are small. This finding may be still potentially be noteworthy because some past research incorporated only income as a money variable and excluded net worth when examining the relationship between money and life satisfaction (Easterlin, 2001; Diener & Biswas-Diener, 2002). The findings in this analysis provide support to the use of including net worth, in addition to income, for better understanding the relationship between money and life satisfaction (Headey, Muffles, & Wooden, 2008).



Whereas, $c = c' + a_1b_1 + a_2b_2$ (i.e., .288 = .236 + (.190) (.277) + (-.003) (.258) accounting for rounding error).

Path Significant

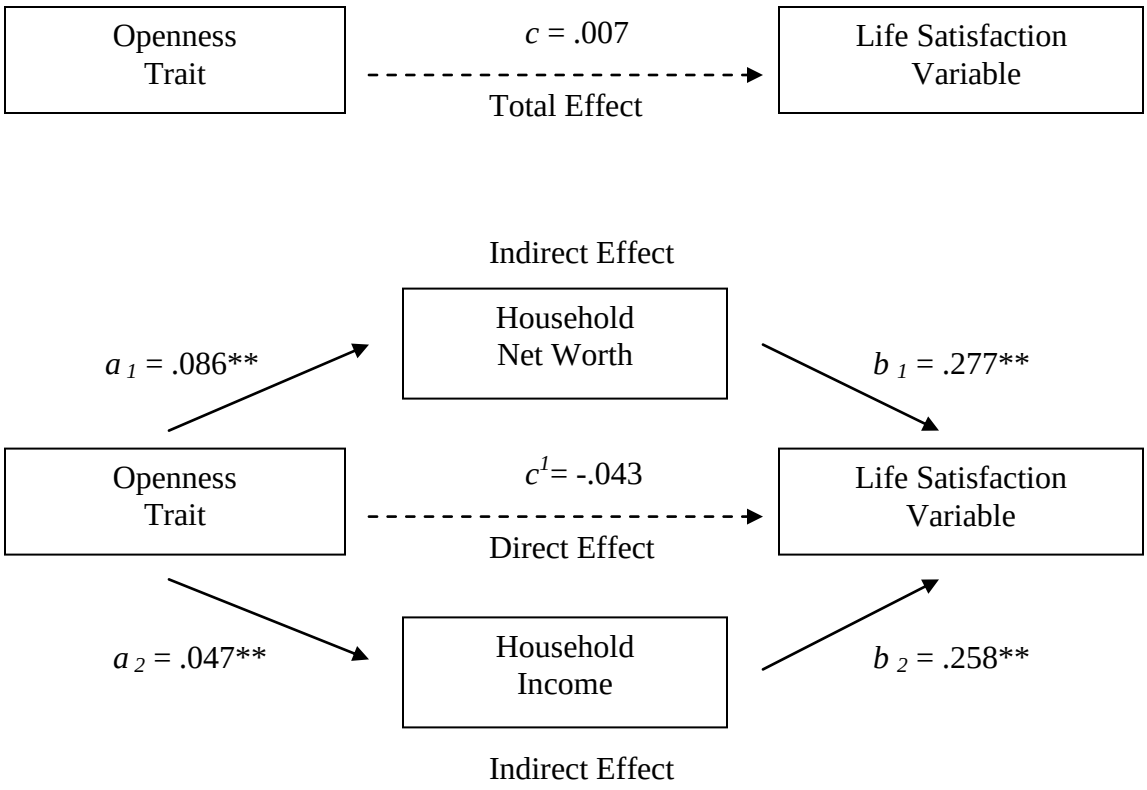
Path Not Significant

Figure 4.9. Mediation Model between Conscientiousness and Life Satisfaction as Mediated by Net Worth and Income

The fourth hypothesis examined the mediation of money between the openness trait and life satisfaction. The results of this analysis produced some interesting findings. First, the study was consistent with other previous research, which indicated no significant direct relationship between the openness trait and life satisfaction (Weiss, Bates, & Luciano, 2008; Albuquerque,

Pedroso de Lima, Matos, & Fiqueiredo, 2012). For example, in Figure 4.10 both coefficient paths in the total effect model and the direct effect model were not significant. Hence, no support for a mediation relationship exists because there is no direct association between the openness trait and life satisfaction. From a doctrine of interaction theory perspective, the findings do not support one's individual openness trait level as being associated with one's life satisfaction level through one's environmental situation as expressed by either net worth or income circumstances.

However, the openness trait was significant in both indirect effect paths (i.e., through net worth and income) as being associated with life satisfaction. These findings could support a potential moderation relationship. Similar to the agreeable trait findings in the second hypothesis analysis, possible support for a moderation relationship exists between an openness and money interaction with life satisfaction based upon the findings in this study. Additional research in this area is also warranted to further explore this relationship.



Whereas, $c = c' + a_1b_1 + a_2b_2$ (i.e., .007 = -.043 + (.086) (.277) + (.047) (.258) accounting for rounding error).

Path Significant

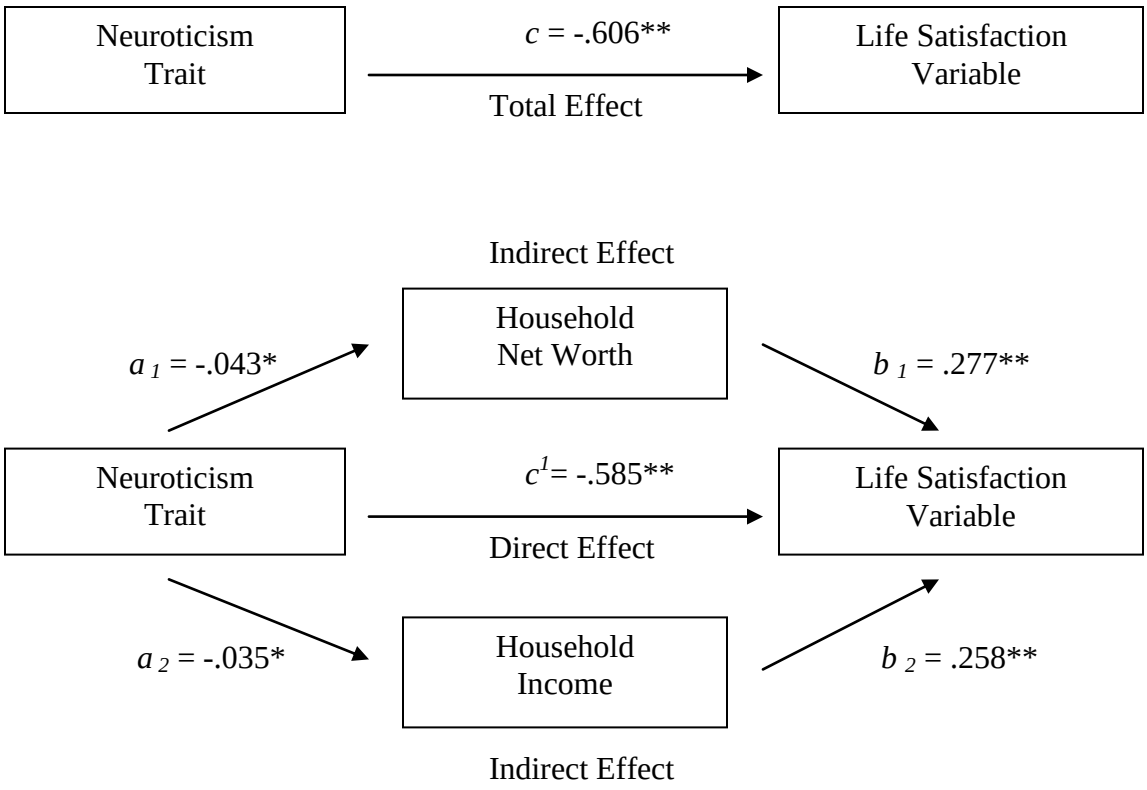
Path Not Significant

Figure 4.10. Mediation Model between Openness and Life Satisfaction as Mediated by Net Worth and Income

The fifth hypothesis proposal was that money moderated the association between the neuroticism trait and life satisfaction. Support for this hypothesis exists in the analysis findings. As shown in Figure 4.11, all paths between variables are significant combined with a smaller *c'* coefficient in the direct effect path relative to the *c* coefficient in the total effect path. The

combination of these findings supports a mediation relationship (Jose, 2013). From the perspective of a doctrine of interaction theory lens, the findings would convey that one's individual neuroticism trait level is associated with one's environmental situation expressed by both net worth and income circumstances and, in turn, one's life satisfaction level.

However, the mediation effect appears small based upon an examination of the *c* and *c'* coefficient values conveying the difference between these values as small (i.e., *c* equals -.606 and *c'* equals -.585). Additionally, the signs and values of the coefficients provide some insight regarding how these variables are associated with one another. It appears the neuroticism trait values are negatively associated with both money variables and life satisfaction, while the money variables are positively associated with life satisfaction. It also appears that the net worth indirect effect path has greater impact than the income indirect effect path in regards to affecting life satisfaction due to the bigger coefficient values in the net worth path.



Whereas, $c = c' + a_1b_1 + a_2b_2$ (i.e., -.606 = -.585 + (-.043) (.277) + (-.035) (.258) accounting for rounding error).

Path Significant

Path Not Significant

Figure 4.11. Mediation Model between Extroversion and Life Satisfaction as Mediated by Net Worth and Income

Conclusion

The focus of this chapter's research was to examine the mediation effect money has on the association between personality and life satisfaction. The findings from the analysis in this

chapter support the presence of a money mediation effect. It appears that money mediates the three personality trait associations with life satisfaction (i.e., extroversion, conscientious, and neuroticism). Furthermore, with all three traits, it appears that the indirect effect path via the net worth variable mediates the personality/life satisfaction relationship more than the income variable indirect effect path. In addition, findings from this study also provide support for potential moderation relationships. Potentially, money and the remaining two personality traits (i.e., the agreeableness and openness traits) may have a moderation effect with life satisfaction based upon the analysis in this study. Further research would be needed to verify these relationships.

Financial planning practitioners advise individuals on financial strategies to improve people's levels of life satisfaction. The findings in this study are important to the financial planning community by providing additional insight regarding the relationship between personality and life satisfaction when incorporating money as a mediating variable. For example, the importance of growing net worth may potentially be more important in regards to life satisfaction for those with higher neuroticism trait levels compared to those with higher conscientiousness trait levels.

In this study's findings and in previous research, net worth was positively associated with life satisfaction (Headey, Muffles, & Wooden, 2008). Furthermore, the direct effect paths for the neuroticism and conscientiousness were also both significantly associated with life satisfaction levels; however, neuroticism was negatively associated with life satisfaction, while conscientiousness was positively associated with life satisfaction. For individuals with higher conscientiousness levels, their personality trait alone potentially provides them with a predisposition for higher life satisfaction, while those with higher neuroticism levels may

potentially have a predisposition for lower life satisfaction. For individuals with higher neuroticism levels, the growth of net worth may potentially be a more vital factor for life satisfaction outcomes compared to those with higher conscientiousness trait levels. As a result, it may be important for financial planners to understand people's personality traits in order to understand their propensity for happiness and the importance of net worth growth to achieve higher levels of life satisfaction.

Another potential application for the financial planning community may be in the area of skill development. Personality is an outward representation of mental preferences (Briggs Myers, McCaulley, Quenk, & Hammer, 2009) and although preference may compliment competency, preference is not a prerequisite for competency development. The conscientiousness trait is positively associated with the judging domain within psychological type theory (Furnham, Moutafi, & Crump, 2003). The judging domain has a preference for decision making (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Using psychological type theory as a framework and the findings regarding the relationship between conscientiousness trait and life satisfaction as mediated by financial variables, such as net worth from this study, financial planners should promote developing people's decisions making competencies regarding money and finances for potentially improving their satisfaction levels.

The limitations of this study include those limitations associated with the Health and Retirement Study (HRS) data set, as previously identified in Chapters Two and Three. These include the limitation of respondents to only one household member in married households, and the potentially incorrect self-assessment responses associated with self-reported data potentially both over and under estimating the value of financial assets (i.e., such as income and net worth

values). Also, the HRS data set focus is limited to only those age 50 and above in the United States.

Suggestions for other research areas to pursue related to the research in this chapter include examining components of net worth and income as potential mediating variables, the addition of other non-financial mediators, and examining other potential dependent variables that may be affected by a money mediation effect on personality. To further understand how money mediates the relationship between personality and life satisfaction, both net worth and income can potentially be broken down into more specific components. For example, net worth variables could be categorized between liquid assets and non-liquid assets. Income could be sub-divided into income from investment earnings, income from wages, and income from pensions. Another avenue to research could be examining how variables that are non-financial (i.e., such as the presence of children, being retired or not, and marital status) mediate the relationship between personality and life satisfaction. A third potential area to study would be examining other relationships associated with personality that money may have a mediating influence.

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Chapter 5 - Conclusion

Introduction

The three essays in this dissertation examined the different associations between individual personality traits and net worth related financial variables. The first two essays utilized psychological type theory (Jung, 1971) as the theoretical framework to guide the research in the studies. The third essay incorporate the doctrine of interactionism (Bowers, 1973) as its theoretical framework. The findings in these studies contribute new information regarding how personality traits are associated with financial decision making and financial outcomes. Financial planning practioners potentially can use to this information to assist those who seek their help.

Essay One

The first study examined the association between personality traits and net worth. According to psychological type theory, personality is an outward expression of how people mentally process information, focus their attention, and their preferences in decision making. This study examined how both individual personality traits and combinations of different personality trait preferences were associated with people's net worth levels.

Individual regession analyses were completed using personality variables as the independent variables and net worth values as the dependent variables. The results of this study identified the extroversion and conscientiousness personality trait variables as positively

associated with higher levels of net worth. The agreeableness trait was found as negatively associated with net worth.

By interpreting these finding from a psychological type theory perspective, financial planners have a potential approach to better communicate with individuals regarding financial strategies involving net worth. For example, in psychological type theory, the extroversion trait is associated with an awareness preference for the outside environment and external events rather than an inward reflection of mental energies (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). Since the extroversion trait is associated with higher net worth levels, financial planners can direct discussions with people to focus on one's surroundings rather than oneself. For example, rather than focusing on oneself and one's individual financial needs, a financial discussion covering the financial needs or financial needs of others (i.e., people in addition to oneself such as one's spouse, parents or children) may lead to greater levels of net worth.

Essay Two

People have access to a variety of different types of financial vehicles to accumulate wealth and build their net worth such as real estate, savings deposit accounts, and financial securities, such as stocks and bonds. Along with the amount of savings, the choice of the financial vehicle influences both the growth potential realized and the risk undertaken (Van Soest & Kapteyn, 2006). Historically, stock market returns have outperformed other asset classes, but have also been exposed to higher levels of volitility (S&P Dow Jones Indices, 2013). The research purpose in the second study was to examine the association between personality traits and stock ownership.

The findings in this study revealed individual traits and trait combinations that were both positively and negatively associated with stock ownership. A preference for the openness trait, the neuroticism trait, the preference combination of high extroversion/high openness, and the preference combination of high openness/low agreeableness were all positively associated with stock ownership. The agreeableness trait and the preference combination of low extroversion/high agreeableness were negatively associated with stock ownership.

By interpreting these results through a psychological type theory lens framework, financial practitioners can both improve their understanding regarding how people with different mental preferences process investment and asset selection decisions differently and potentially influence people's choices. For example, the openness trait (i.e., related to imagination, creativity, and symbolism) is positively associated with the intuition domain within psychological type theory (Furnham, Moutafi, & Crump, 2003). Based upon psychological type theory, financial planners may consider incorporating intuition domain type discussions to encourage stock investing in situation whereby equity allocation is under weighted within an investment portfolio.

Essay Three

The third study in this dissertation built upon three known associations in existing research. These include: (a) an identified association between personality and money (i.e., essay two); (b) an identified association between personality and life satisfaction (Harrington & Loffredo, 2001; Weiss, Bates, & Luciano, 2008); and (c) an identified association between money and life satisfaction (Easterlin, 2001; Diener, Ng, Harter, & Arora, 2010). The focus of this study was to further expand the understanding between these three variables (i.e.,

personality, money, and life satisfaction) by examining how money mediates the association between personaltiy and life satisfaction.

The findings in this study provided support that the association between personality and life satisfaction is mediated by money. Based upon this study's results, the extroversion, conscientiousness, and neuroticism traits had both a direct effect association with life satisfaction, as well as, an indirect effect association with life satisfaction that was mediated by money. Money was represent by both net worth and income in this study.

If advisors and counselors understand how people's mental preferences are expressed by their personality traits, then they can use the findings in this study to assist people to achieve higher potential levels of life satisfaction. For example, advisors can help people evaluate their own traits levels in different personality domains. They can then help people strengthen those traits that are positively associated with higher levels of net worth, income, and life satisfaction.

Conclusion

Personality is an outward expression of how people focus their energy along with how they perceive and process information (Briggs Myers, McCaulley, Quenk, & Hammer, 2009). The goal of this dissertation was to examine how mental preferences expressed through personality was associated with various components of wealth building.

The findings from the three studies in this dissertation all provide information that finanical practitioners can used to assist people who seek their financial guidance. For example, the findings in study 1 conveys which personality types are associated with net worth. Financial planners can use this information with individuals to promote preferences associated with higher net worth if wealth accumulation is a desired objective for people. Study 2 reported results

pertaining to the association between personality traits and stock ownership. These findings can be used by planners for identifying people who have a higher predisposition for stock ownership and who may be better candidates for incorporating saving strategies that involve stock investing. Finally, Study 3's findings may potentially help financial planners in understanding how the relationship among personality traits, life satisfication, and financial variables such as net worth and income are associated with one another. Financial planners can use this information by varying recommendations regarding net worth and income based upon people's personality traits since life satisfaction based upon net worth and income may also vary based upon people's preferences expressed by their personality traits.

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