

ABSTRACT

Hucul, Donna Terese. Identifying Self-efficacy and Financial Behaviors as Predictors of Undergraduate College Students' Financial Literacy at a Land Grant University in North Carolina. (Under the direction of Dr. Carol Kasworm, Ed.D).

Financial literacy has become a serious concern in the wake of the Great Recession of 2008. This study explored the financial literacy of undergraduate college students, who as a group constitute a distinct cohort of learners, emerging adults. The college student population represents a financially at-risk group facing mounting student loan debt. This student loan debt has risen to unprecedented pinnacle exceeding one trillion dollars in aggregate. The current quantitative study identified behavior-based predictors of undergraduate college students' financial literacy and was conducted at a research-extensive land-grant university in North Carolina.

In a one of a kind research investigation framed in self-efficacy theory, this study identified the importance of two very important behavior-based predictors of undergraduate college students' financial literacy, self-efficacy and financial behaviors. Three distinct predictive models were created in this study. One model, in which the selection of its predictors was based on existing research investigations, identified six predictors of undergraduate college students' financial literacy including demographics, motivation and specific types of financial behaviors. A second model, whose predictors were based on the current study's exploration uniquely framed in Self-Efficacy Theory, identified ten predictors of undergraduate college students' financial literacy including demographics, self-efficacy and specific types of financial behaviors. A third predictive model's hierarchical presentation based on the current study's three research questions emphasized the impact that

the second model's predictors, entered in additive blocks, made on the model's overall effect size, with the self-efficacy predictors contributing the greatest impact.

Three main conclusions resulted from this study. First, self-efficacy predictors had the greatest amount of influence on the overall effect size of a model predicting the financial literacy of undergraduate college students. Second, financial behaviors of undergraduate college students were found to be statistically significant predictors of the financial literacy of undergraduate college students. Third, older undergraduate college students and those with a business as primary major in college were more financially literate, while female students were not more financially literate. In general, the current study's findings underscored the importance of student demographics as predictors of undergraduate college students' financial literacy.

The current study offers new empirical evidence for consideration and discussion among researchers, financial literacy program practitioners, and policy makers. Recommendations are provided along with implications for research, practice and policy based on the study's key findings.

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Identifying Self-efficacy and Financial Behaviors as Predictors of Undergraduate College
Students' Financial Literacy at a Land Grant University in North Carolina

by
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A dissertation submitted to the Graduate Faculty of
North Carolina State University
in partial fulfillment of the
requirements for the degree of
Doctor of Education

Adult and Community College Education

Raleigh, North Carolina

2015

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DEDICATION

This Ed.D, which represents the fourth and terminal college degree in my adult education experience, is dedicated to the memory of my parents, Alexander and Virginia Hucul, who from my earliest childhood memories endeavored to instill in me the importance of college education. Mom and Dad, I made it! Further, my college education has opened more doors and paved more new pathways in life than I ever could have imagined.

Second is a very important posthumous dedication in memory of Dr. Colleen Aalsburg Wiessner who NC State University's Adult and Community College Education Program lost too soon. Very early in my Ed.D program studies at NC State I had made an immediate and very strong connection with Dr. Wiessner, a kind and gracious educator whose spirit shone brightly. Creativity, imagination and collaboration are the endearing qualities that I came to associate with Dr. Wiessner. Dr. Wiessner's compassion and wisdom as a mentor live on in me and many in my cohort who were blessed to have known this amazing scholar, educator and woman.

BIOGRAPHY

Hucul's college education began with a Community College Degree earned as a young adult residing in Michigan. Within the next 12 years while working full-time and attending college as a part-time night school student, Hucul earned two more college degrees, a Bachelor of Science in Business Administration and an MBA in Finance. An MBA in Finance degree helped Hucul secure part-time opportunities teaching college which helped precipitate a desire to become full-time college professor. This education doctorate represents the terminal college degree for Hucul. With a topic of financial literacy, this dissertation study reflects Hucul's research interests in the area of finance along with her interest in the area of college/adult education.

ACKNOWLEDGMENTS

To my dissertation chair Dr. Carol Kasworm, who with tenacity throughout the lengthy process, gave of her scholarly guidance liberally. With much appreciation to Dr. Carolyn Bird for arranging an independent study with me in the semester during which her study's data collection occurred. The independent study turned into an opportunity which would end up becoming a research apprenticeship – every graduate student's dream - for me. Many thanks to Dr. Roger Woodard for his statistical wizardry which resulted in guiding me to create multiple regression models that served to best illuminate this study's findings. Kindly acknowledging Dr. Tuere Bowles for lending a spiritual presence to my committee by filling a void left by the sudden passing of Dr. Colleen Weissner.

With special gratitude to Dr. Jennifer A. Morrow and Dr. Dena Wise of the University of Knoxville-Tennessee, for sharing the NC State control group component of their multi-institution study's dataset with this doctoral student. Special thanks to Dr. Amy Orders and Dr. Joanne Caye for offering their support and encouragement at a particularly arduous juncture in my doctoral program journey.

Last, yet with utmost appreciation to my sister Sharon, not only my best friend but also my number one supporter. Thanks for being there to cheer me on and lend me an ear, listening as the drama unfolded throughout the entire dissertation process.

TABLE OF CONTENTS

LIST OF TABLES	viii
LIST OF FIGURES	ix
CHAPTER 1	
Introduction.....	1
Financial Challenges and Society	1
Financial Challenges in a Capitalist Economy	2
Financial Challenges for College Students	4
Financial Literacy	6
Research in Financial Literacy.....	7
Conceptual Framework.....	10
Self-Efficacy Theory.....	11
Problem Statement.....	13
Purpose.....	14
Research Questions.....	15
Significance for Research and Theory.....	15
Significance for Practice and Policy	16
Limitations	16
CHAPTER 2	
Literature Review.....	18
Conceptual Framework.....	20
Self-Efficacy Theory.....	21
Financial Literacy Models	25
The Hung, Parker & Yoong Conceptual Model of Financial Literacy.....	27
The McQuaid and Egdell Model of Financial Capability.....	29
The Leskinen and Raijas Life Cycle Approach to Consumer Financial Capability	32
The Huhmann and McQuitty Conceptual Model of Financial Numeracy.....	36
Summary of Financial Literacy Models	38
Selected Studies in the Financial Literacy of College Students	39
Financial Literacy Definitions	40
Financial literacy factors	46
Financial Literacy Tests.....	48
Test background	48
Test format	49
Pilot testing and test item construction.....	51
Reliability.....	52
Validity.....	53
Summary of Selected Studies in the Financial Literacy of College Students.....	57
Financial Literacy Programs.....	58
Historical Context of Financial Literacy Programs	58
Contemporary Context of Financial Literacy Programs.....	60

Financial literacy programs focused on college students	63
Sponsorship and delivery of financial literacy programs for college students	64
Summary of Programs in Financial Literacy for College Students	66
Chapter Summary	67
CHAPTER 3	
Methodology	69
Research Site and Sample	70
Population and Sample	70
Research Design	72
Research Questions	72
Variables used in the Predictive Models	73
Dependent Variable	74
Predictor Variables	74
Model One Predictors	74
Model Two Predictors	77
Instrumentation	78
Survey Instrument	78
Pilot Study Background	79
Financial Literacy Test Item Analysis	79
Reliability and Validity	80
Reliability	80
Validity	81
Face validity	81
Content validity	81
Predictive Validity	82
Data Collection and Confidentiality	83
Data Analysis	84
Predictive Models	85
Measurement Model	86
Limitations/Delimitations	87
CHAPTER 4	
Findings	90
Descriptive Statistics	91
Undergraduate College Students' Self-Efficacy and Financial Behaviors	93
Undergraduate College Students' Personal Financial Wellness	95
Undergraduate College Students' Financial Literacy	97
Evaluation of Financial Literacy Test Items	99
Reliability and Validity	101
Predictive Models	103
Chapter Summary	110
CHAPTER 5	

Summary, Conclusions, Implications and Recommendations.....	112
Overview of the Study	112
Descriptive Summary of Undergraduate College Students' Financial Experiences	113
Undergraduate Students' Financial Behaviors.....	116
Undergraduate College Students' Personal Financial Wellness.....	118
Summary of Predictive Model Findings.....	119
Conclusions.....	125
Implications and Recommendations	128
Implications and Recommendations for Education Practice	129
Implications for Policy.....	130
Chapter Summary	131
REFERENCES	132
APPENDICES	151
Appendix A.....	152
Table A1. Predictors of the Onset of Credit Card Debt among College Students	152
Table A2. Predictors of Investment Knowledge among Midwestern College Alumni.....	153
Table A3. Predictors of Financial Literacy of Australian University Students	154
Table A4. Predictors of Financial Literacy of Students at a Predominantly Black University.	155
Table A5. Predictors of Financial Literacy among First Generation Female College Students	156
Table A6. Post-test Regression Model Results of a Financial Educational Intervention with College Students.....	157
Appendix B	158
Figure B1. Investor Education for College Students – Control Group Posttest Survey	158
Appendix C	174
Figure C1. IRB Consent Form.....	174
Figure C2. IRB Request for Exemption Approval	177
Figure C3. Judge's Rating Form for the 17-item Financial Literacy Test	178
Appendix D.....	182
Figure D1. Personal Financial Wellness (PFW) Scale ©	182
Figure D2. Normative Descriptive Terminology for Interpreting PFW Scores.....	183
Figure D3. Monitor Classification Legend.....	184
Table D1. Undergraduate College Students' Self-Confidence Ratings toward their Financial Abilities	185
Table D2. Undergraduate College Students Motivation Ratings toward their Financial Abilities	186
Table D3. Item Difficulty Indices of Financial Literacy Test Items	187
Table D4. Item Discrimination Indices of Financial Literacy Test Items.....	188
Table D5. Content Validity Coefficients of Inter-Rater Consensus by a Panel of Expert Judges	189

LIST OF TABLES

Table 2.1. Selected Studies in Financial Literacy of College Students: 2003 – 2013	41
Table 3.1. NC State Student Enrollment as a Percentage of the Undergraduate Population, Fall 2010	71
Table 4.1. Undergraduate College Student Demographics: Comparison of Population and Sample.....	92
Table 4.2. Undergraduate College Students' Personal Financial Wellness Scores	96
Table 4.3. Financial Literacy Test Scores of Undergraduate College Students	98
Table 4.4. Expert Judges Panel Ratings for the 17-item Financial Literacy Test.....	103
Table 4.5. Predictors of Undergraduate College Student Financial Literacy	108
Table 4.6. Hierarchical Model of the Predictors of Undergraduate College Student Financial Literacy	110

LIST OF FIGURES

Figure 1.1. Social Cognitive Theory: Triadic Reciprocity.....	11
Figure 2.1. The Hung, Parker & Yoong Conceptual Model of Financial Literacy	28
Figure 2.2. The McQuaid and Egdell Model of Financial Capability	30
Figure 2.3. Dynamics of Household Economic Activities and Consumer Finances	34
Figure 2.4. The Huhmann and McQuitty Conceptual Model of Consumer Financial Numeracy	37
Figure 3.1. Content Validity Calculation of Financial Literacy Test Items based on Inter-rater Consensus of Five Expert Judges	82
Figure 3.2. Measurement Model of the Predictors of Financial Literacy of Undergraduate College Students	87

CHAPTER 1

Introduction

Financial Challenges and Society

Not since the Great Depression of 1929 has the awareness, knowledge, preparedness and ability for effectively managing and protecting one's financial resources been so important. The 2008 U.S. economic crisis and resulting Great Recession created pressing challenges in the ability to maintain financial well-being for many Americans. In our capitalist society, adults have contributed to the economy on a daily basis by interacting as consumers, laborers, and investors. These daily interactions required certain knowledge, skills and abilities, which could be broadly categorized as managing finances effectively to successfully maintain one's financial well-being, and managing one's finances prudently to avoid financial consequences and pitfalls. The U.S. economy has relied heavily on financial interactions of Americans as consumers who have contributed to its Gross Domestic Product (GDP), historically the benchmark measure of U.S. economic strength. From 2008 to 2013, America found itself grappling with its worst period of GDP growth dating back to 1948 (Young, 2013).

As of late 2013, the U.S. was still struggling through a long and sluggish recovery from the Great Recession (Desilver, 2013). Using job growth as a recovery benchmark, the period for regaining jobs lost between 2008 and 2010 lasted over five and one-half years. Such slow growth in restoring jobs lost to economic downturn had not been experienced by American workers for over 60 years (Young, 2013). At the same time, Americans

experienced unprecedented financial challenges and pressures in the country's capitalist economy where individual responsibility for one's own financial sustenance throughout life became more important than in the recent past. As the financial problems of individuals spread across wide-scale proportions of the population, the aggregate financial problems of hundreds of thousands of individuals become a societal woe, and indeed this impact was seen in U.S society during the post-Great Recession years.

Financial Challenges in a Capitalist Economy

Financial challenges for individuals in U.S society have been linked to influences in our capitalist economy. Leading up to the great recession of 2008, there was a dismantling of regulation in the financial industry (Chandrasekhar, 2012). At the same time, there was a proliferation of new product and service offerings by financial institutions (Lusardi, 2008). An economic environment of profit-driven businesses supported increased social acceptability of the use of credit, and lending institutions were happy to oblige the borrowing habits of American consumers.

Capitalism has been defined as “an economic system characterized by private or corporate ownership of capital goods, by investments that are determined by private decision, and by prices, production, and the distribution of goods that are determined mainly by competition in a free market” (Merriam Webster Dictionary Online, n.d.). A pillar of U.S. capitalism included an economic climate that fosters free enterprise. Toward that end, capitalism in the U.S. evolved with a focus on the autonomous individual engaged in competitive practices seeking self-advancement in achieving financial assets and financial

security (Brookfield & Holst, 2011). The U.S. consumer-driven economy promoted a culture where freedom and individuality were exercised through consumer choices. Consumers were enticed by merchants whose profit goals focused on expanded sales. Further, American consumers came to see the availability of credit-backed financing as a necessary right (Finlayson, 2009). Access to credit and borrowing had become more widespread than ever before, while consumer spending remained the U.S. economy's biggest growth engine (Lange, 2012).

Pressured by economic uncertainty, financial markets and institutions transferred onto individuals increasingly more financial responsibility and accountability for securing their own financial futures. Over the course of the last three decades, the vast offerings among financial products and instruments became quite complex, thereby presenting individuals with choices for numerous and increasingly sophisticated financial products (Lusardi, 2008). Knowledge of the processes for obtaining, managing and developing financial resources became a “tenet for societal success” in our capitalist economy (Lucey & Giannangelo, 2006, p. 268).

Precipitated by the collapse of the mortgage credit market in the U.S., widespread freezing of credit throughout U.S. markets and institutions in 2008 and 2009 contributed to a global recession (Altman, 2009; Wald, 2010). In yet another onerous example of collective American debt obligation, as of May 2013 the Consumer Financial Protection Bureau reported aggregate outstanding student loan debt in excess of \$1.2 trillion (Chopra, 2013). Concerns exist that widespread defaults on ever-increasing student loan debt could turn out

to be the precipice of another financial jolt to the U.S. economy (Norris, 2014; Touryalai, 2014).

Financial Challenges for College Students

In response to rising college costs, the use of financial aid in the form of student loans has become essential for increasing numbers of college students (Eisler & Garrison, 2014; Jones-White, Radcliffe, Lorenz & Soria, 2013). Achieving financial literacy may be particularly important to college students who comprise a financially at-risk group. College students remain an at-risk population exposed to troubles from debt overload, as can be evidenced by over \$1 trillion in outstanding student loan obligations. As of 2013, student loan debt in the U.S. had risen to an unprecedented \$1 trillion, which surpassed both this country's aggregate outstanding car loan debt of \$730 billion and consumer credit card debt of \$693 billion (Brown, Haughwout, Mabutas, & Van der Klaauw, 2012). The repercussions of over-indebtedness can be stressful and long lasting. For college students, over-indebtedness resulted in barriers to success and degree completion, as well as in dysfunction and unhappiness in their individual and family lives (Eitel & Martin, 2009; Mandell & Klein, 2007).

Student debt has been on the increase over the past three decades due to a variety of factors. In the 1980s, tuition began rising at a faster pace than family incomes (National Center for Education Statistics, 2012). Since the 1990s, cuts in federal and state funding at public universities have shifted the burden of paying for higher education from the general taxpayer to students and their families (Breneman, 2002). A reduction in grants also

precipitated a shift to student loans as means of financing college education (Hillman, 2014). In the 1990s, the advent of for-profit universities whose business model relies heavily on debt-financed education helped propel the increase in student debt (Deming, Goldin & Katz, 2012).

Economic turbulence leading up to and following the 2008 Great Recession contributed to challenges for college students in a few significant ways. As the family's ability to contribute to the cost of their college student's education declined, more students found themselves needing to pay for a greater proportion of their college education costs. To cover increased expenses, students found it necessary to work, postponing graduation beyond the expected four-year matriculation (Jones-White et al., 2013). Further, financial pressures led some college students to increase their student loans to cover living expenses and other personal expenditures (Soria, Weiner & Lu, 2014). Other actions taken by financially strapped college students included skipping meals, increasing credit card debt, or taking a community college course which was less expensive.

While it is not unusual for repayment of student loan debt to take as long as 10 years, students have been opting for extended repayment plans which could take 20 to 25 years for loan repayment (Coy, 2012). Extending over a multitude of years, student loan debt obligations may inhibit or postpone the ability of young adults to buy their first home, save for their children's college education fund(s) and/or begin saving for their own retirement. Given these lifelong issues of debt and its impact upon livelihood, it is imperative to better prepare college students to make optimal financial decisions early on, beginning with their

first experiences in credit-based financing activities while still attending college. For this reason, scholars and educators, as well as higher education leaders and policy makers have taken an interest in the financial literacy of college students.

Financial Literacy

As college students graduate and join the adult workforce, they will assume a role in the collective financial success of this country's economic growth and future development by contributing as producers of products or services, taxpayers and consumers. Financial literacy is a concept that acknowledges the extensive financial acumen and capability needed to become a successful economic contributor. The following definition of financial literacy was used for the current study:

The ability to read, analyze, manage and communicate about personal financial conditions that affect material well being. It includes the ability to discern financial choices, discuss money and financial issues without (or despite) discomfort, plan for the future, and respond competently to life events that affect everyday financial decisions, including events in the general economy. (Vitt et al., 2000, p. 2)

This broad and all-encompassing definition speaks to the level of sophistication needed to navigate in a complex economy which offers a plethora of choices and options, requiring ever-increasing levels of skill in financial decision making and planning. The Vitt et al. definition addresses knowledge, skills, abilities, awareness and preparedness needed to

maintain financial well-being by successfully managing finances prudently while avoiding financial consequences and pitfalls.

Dr. Vitt was contacted by email regarding the use of her definition under Bandura's (1986, 1994) conceptual framework, which is discussed later in this chapter. Compatibility of the Vitt definition with the context of the current study was affirmed by comments in her email response: "Finance and financial literacy are social constructions, and it is entirely appropriate to use social frameworks to study them. I've written two books and other papers that incorporate sociological and psychological theories into the study/practice of personal finance" (L.A. Vitt, personal communication, October 17, 2011).

In addition to the key contribution of conceptual definitions from research, evidence-based data exists as well. Research has indicated the financially at-risk college student population has exhibited low levels of financial literacy. Results from multiple-choice tests in financial literacy given to college students have shown average test scores ranging from 30-62% (Avard, Manton, English & Walker, 2005; Chen & Volpe, 1998; Mandell, 2009; Murphy, 2005; Norvilitis, Merwin, Osberg, Roehling, Young & Kamas, 2006).

Research in Financial Literacy

Contributions from research have resulted in the creation of a unique body of knowledge, theory and evidence delineating the foundation of the concept of financial literacy. Historically, research in financial literacy was focused on one of two groups, either adults or K-12 learners. Taking a cue from biennial studies of K-12 students' financial literacy conducted from 1998 to 2006 (Mandell, 2009), researchers began examining

financial literacy levels of college students. College students were identified as the third important group known as emerging adults (Leskinen & Raijas, 2005). Beyond results gathered from administering financial literacy tests capturing knowledge, skills and abilities to measure financial literacy skills, research has made key contributions toward identifying relationships that exist between college student attributes and their levels of financial literacy.

Little if any research in the financial literacy of college students has focused on examining which specific financial behaviors could be used to predict their financial literacy levels. While one study found more frequent credit card use and lower financial literacy predicts the onset of debt among college students (Norvilitis, Merwin, Osberg, Roehling, Young & Kamas, 2006), there is a lack of studies that examine the predictive relationship between the students' financial behaviors and financial literacy levels. One purpose of the current study was to evaluate whether college students' financial behaviors could be used to predict their financial literacy levels. For the current study, financial behaviors were evaluated across Lusardi's (2009) typology of four classes of financial transactions: (1) use of traditional sources for borrowing excluding credit cards, (2) use of alternative sources for borrowing, (3) methods of saving, investing and paying and (4) credit card use.

What is known from research about financial behaviors of college students is that young adults have shown deficiencies in their levels of understanding and actions with regard to money management and planning for future economic goals (Lusardi, Mitchell, & Curto, 2010). A survey-based study of first year college students starting college at a large research

university found that as credit card debt and/or school loan debt increased, students were more likely to demonstrate unhealthy attitudes and behaviors towards spending, saving, and debt (Everfi and Higher One, 2014). For example, making late credit card payments within the past year had the strongest significant association with students who viewed debt as a necessity.

In terms of positive financial behaviors, the same study found having a checking account predicted positive financial behaviors in the areas of budgeting, saving, and managing debt. Financial behaviors such as planning to follow a budget or being able to pay off student loan debt in the future were most strongly associated with students reporting cautious financial attitudes. Cautious financial attitudes were measured using students' concerns about debt, understanding of the importance of savings, and the notion that sacrifices sometimes need to be made. For example, a cautious financial attitude could be the decision to stay home for the evening rather than borrowing money to go out.

Regarding risky financial behaviors, seven out of ten college students will engage in at least one "risky" financial behavior, such as maxing out credit card limits or not paying bills on time (Shim, Serido, & Xiao, 2009). College students were found to engage in fewer risky behaviors when there were higher parental expectations and the students' reported having positive financial attitudes.

In addition to financial behaviors, the current study considered another key factor, behavioral influences in relation to the financial literacy of college students. There has been a paucity of past research exploring behavioral influences of college students associated with

their self-perceived financial abilities. Neither motivation nor self-confidence, two important aspects of self-efficacy, has been used in predicting the financial literacy levels of college students. Motivation has been used in the past to evaluate high school seniors' interest in and ability to maintain skills learned in financial literacy programs (Mandell & Klein, 2007). Mandell and Klein found the use of motivation variables significantly increased their ability to explain differences in the financial literacy test scores among 17 and 18 year old students. As a potential key behavioral influence on financial literacy, the current study would expand Mandell and Klein's (2007) research by targeting the undergraduate college student population, emerging adults, and by using a broader behavioral influence, self-efficacy in lieu of the sole influence of motivation.

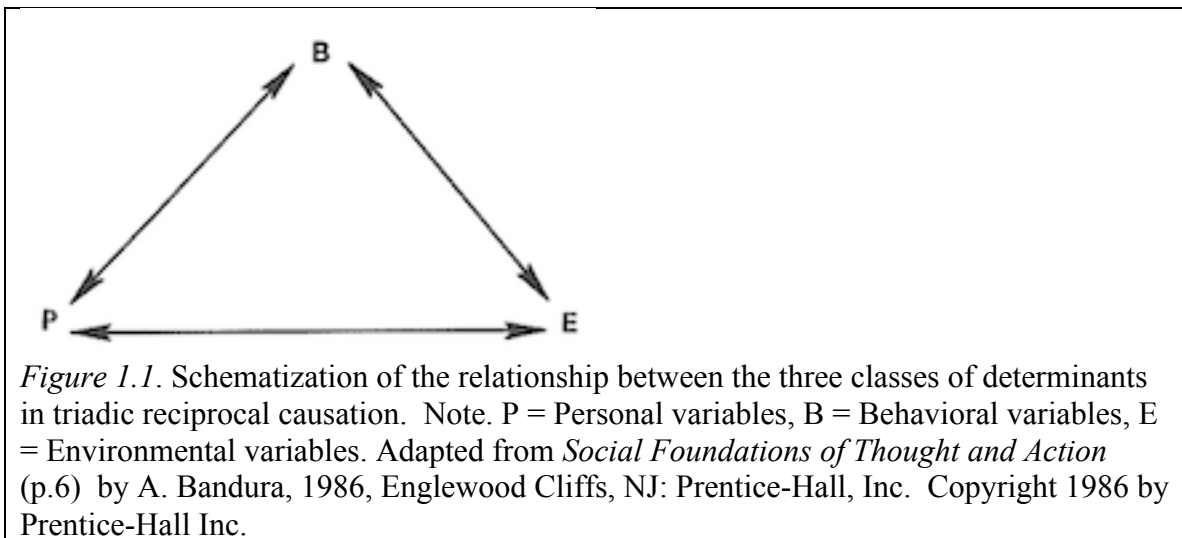
Conceptual Framework

Filling a gap in research associating financial behaviors and behavioral influences with financial literacy, the current study was grounded in Self-Efficacy Theory (Bandura, 1994). Self-Efficacy Theory is situated within Social Cognitive Theory (SCT), and was developed as a result of Bandura's efforts to create a refined focus on personal behavioral influences (Bandura, 1986). With its origins in SCT, Self-Efficacy Theory will be discussed following a brief summary of SCT.

Learning of behaviors involves cognitive processes and reasoning (Bandura, 1986). SCT was developed to explain how during a person's self-development, adaptation and change occur through bi-directional exchanges among three main determinants: personal, behavioral and environmental influences. The concept of the bi-directional exchange among

SCT's three influences was conceptualized in Bandura's (1986) triadic reciprocal causation model (see Figure 1.1, Social Cognitive Theory: Triadic Reciprocity). It is important to note that SCT's added dimensions of socio-cognitive and social learning influences differentiate it from earlier behavioral theories. In developing SCT, Bandura sought to include the power of social modeling through incorporating an understanding that a person's beliefs, self-perceptions and expectations are all influential factors associated with behavior.

Figure 1.1. Social Cognitive Theory: Triadic Reciprocity



Self-Efficacy Theory

Bandura's work with SCT was the grounding for Self-Efficacy Theory (Bandura, 1986, 1994). Bandura considered mastery experiences a powerful vehicle for transformation and personal change (Davidson & Bandura, 2003). Thus, Self-Efficacy Theory was developed to help explain behavioral influences on an individual's adaptation and adjustment when faced with unfamiliar or discomforting challenges. Bandura described self-efficacy as a person's belief in his or her ability to produce desired results by his or her own actions, and

Bandura views self-efficacy as the foundation of human motivation and accomplishments (Davidson & Bandura, 2003). According to Bandura, reducing intimidating tasks to small and easily mastered steps creates successes in new experiences. As the individual gains confidence and proficiency in incremental tasks, successes in new experiences become attainable. Skill mastery helps instill a belief in the ability to improve an individual's life, perhaps by engaging in activities that were previously avoided due to fear or phobia.

Self-Efficacy Theory was chosen as the conceptual framework for the current study because of its link to human capability, which implies competent functioning. The current study's (Vitt et al., 2000) definition of financial literacy predominantly represents financial capability. A focus on self-efficacy was used to underscore the difference between possessing skills and abilities and being able to apply them well under diverse and/or adverse circumstances. Self-efficacy is built with experience, in layers, over time. In other words, self-efficacy is a generative capability. This complex capability engages cognitive, social and behavioral skill sets by organizing them into courses of action, integrating them to respond to innumerable purposes (Bandura, 1986).

According to Bandura (1997), self-efficacy beliefs are strong predictors of abilities. The current study used two aspects of self-efficacy as predictors of college students' financial literacy. The first, motivation, is a key component of self-efficacy. Motivation has been defined as, "the process that initiates, guides and maintains goal-oriented behaviors" (Psychology Dictionary Online, n.d.). Motivation involves the individual's amount of effort, duration of the effort, sense of urgency and/or resilience in developing self-efficacy (Bandura

1989). The second aspect is self-confidence. Self confidence has been defined as “a feeling of trust in one’s abilities, qualities, and judgment” (Oxford Dictionaries Online, n.d.). Greater self-confidence may benefit individuals by allowing them to view their abilities more optimistically and in turn undertake more ambitious goals, especially when facing daunting challenges (Benabou & Tirole, 2002). Benabou and Tirole also assert that self-confidence helps individuals counter their natural tendency to readily quit or give up, because they understand that self-confidence in current endeavors helps build self-confidence toward future endeavors.

The current study uses Bandura’s (1994) Self-Efficacy Theory as a form of inquiry into a key behavioral influence regarding college students’ self-perceptions of their financial literacy. Its unique behavioral framework serves to extend the foundation for the conceptualization of financial literacy to include self-efficacy and self-confidence (Shim, Barger, Card, Xiao & Serido, 2010).

Problem Statement

Research-based evidence has indicated that college students exhibit low levels of financial literacy. Because past studies have overlooked financial behaviors and self-efficacy as important influences on college students’ financial literacy, the current study explored these two behavior-related influences as possible predictors of college students’ financial literacy levels.

First, an exploration was undertaken to determine which financial behaviors might be predictors of college students’ financial literacy levels. While research indicated that

positive financial behaviors were associated with improved financial well-being of college students (Gutter & Copur, 2011; Norvilitis & MacLean, 2010; Xiao, Tang, & Shim, 2009), there was a lack of evidence of the impact of financial behaviors on college students' financial literacy.

Second, the current study examined college students' self-efficacy as a means of looking at which behavioral influences might be used to predict the students' financial literacy levels. As emerging adults moving toward financial independence, college students find themselves faced with building a complex set of knowledge, skills and abilities required for financial well-being in a capitalist society. This repertoire includes the ability to manage their finances wisely and prudently so as to avoid financial consequences and pitfalls. Building such a sophisticated and complex set of financial competencies requires determination, motivation and fortitude. Because self-efficacy serves as a foundation for motivation and accomplishment (Davidson & Bandura, 2003), the current study sought to fill a void thus far overlooked regarding the potential of self-efficacy's influential role on college students' financial literacy.

Purpose

The purpose of the current study was to evaluate whether college students' financial behaviors and self-efficacy could be used to predict their financial literacy levels. Financial behaviors were evaluated across Lusardi's (2009) typology of four classes of financial transactions: (1) use of traditional sources for borrowing excluding credit cards, (2) use of alternative sources for borrowing, (3) methods of saving, investing and paying and (4) credit

card use. Self-efficacy as a behavioral influence was evaluated using two types of self-perceived financial ability measures: motivation and self-confidence. Lastly, demographic attributes were examined for purposes of describing characteristics of the undergraduate college students who participated in this study.

Research Questions

The current study addressed three research questions exploring predictors of the financial literacy of college students:

1. Does college students' self-efficacy predict their financial literacy?
2. Which financial behaviors predict the financial literacy of college students?
3. Among college students, which demographic characteristics describe who is more financially literate?

Significance for Research and Theory

There has been limited past knowledge of behavior-based predictors of financial literacy of college students as emerging adults (Leskinen & Raijas, 2005). There are no known studies which have used Self-Efficacy Theory as a framework for examining predictors of the financial literacy of college students. With its unique framework positioned in the behavioral theory of self-efficacy, the current study intends to fill a gap in research by providing a new conceptual basis delineating the foundation of the concept of financial literacy, and providing empirical evidence of the behavioral based predictors of financial literacy of college students using this unique conceptualization. The current study also extends the work of others to answer the call for more research on behavior and behavioral

influences associated with the financial literacy of college students (Volpe, Chen & Pavlicko, 1996; Shim, Barber, Card, Xiao & Serido, 2010).

Significance for Practice and Policy

Financial literacy educators and program planners may find evidence from the current study useful for developing quality educational programs. A stronger focus on financial behaviors that are of relevance and interest to college students could be used in creating financial literacy programs that better capture and maintain the students' interest. The current study's findings could also be used to enhance financial literacy programs for college students by targeting emerging young adults' self-efficacy in an effort to better prepare them to adapt to new, challenging and ever more sophisticated financial demands of our country's dynamic capitalist economy.

Policy makers may gain insight that is useful in defining goals and standards for the financial literacy of college students. The current study highlights college students as a financially at-risk population who would benefit from better retention of financial knowledge, skills and abilities delivered through quality educational programs.

Limitations

Limitations of a more general nature are discussed in this section. Additional limitations relating to methodology or specific variables in the study's sample and can be found at the end of chapter 3.

A limitation is the generalizability of results based on undergraduate college students who were enrolled in one particular public university. Regional factors may have influenced

the results with current study being limited to a geographic area and student population in North Carolina. Time and monetary constraints prevent a national or regional survey of all college undergraduate students. Further, the results may not be applicable to young adults, 18 to 23 year-olds, in North Carolina who did not attend college.

Lifespan considerations for adult learners and their experiences are not considered within the parameters of the current study. Rather, the study predominantly applies to a younger age group, traditional age undergraduate college students, 18 to 23 year olds. These individuals are emerging adults whose frame of reference in adult life experience is in its early stages. Students' prior exposure to finance management practice within unique family situations such as working in a family owned business, or income and expense knowledge acquired growing up in an agriculture or family farm business were not considered within the scope of the current study.

CHAPTER 2

Literature Review

The literature review begins with an overview of the conceptual framework for the current study. Behavioral theory was chosen for the current study's investigation to help bring clarity to the drivers of the sophisticated and complex concept of financial literacy. The current study was positioned within the framework of Self-Efficacy Theory, which was developed to explain how people acquire competencies and are motivated to take action (Davidson & Bandura, 2003). Next will be a review of existing financial literacy conceptual models. Selected financial literacy models chosen for review are important to the current study for their conceptual illustration of the association of financial behaviors and behavioral influences with financial literacy.

A review of research based on selected studies in the financial literacy of college students is then presented to reveal current understandings of college students' financial literacy. Financial literacy encompasses a complex and sophisticated set of skills, abilities and knowledge that enables individuals to understand, analyze and synthesize information, manage and plan, and make wise and prudent choices about financial matters in the face of changing conditions. College students' learning and development of financial literacy is on a growth trajectory during their emerging adult years as they begin their transition to financial independence. New experiences abound as they learn about opportunities and pitfalls regarding the sources and uses of credit in a consumer-driven economy. Many students are not experienced with budgeting of their financial resources. Rather, the students tend to

spend until their funds are exhausted and then resort to skipping meals or calling their parents to ask for additional funds. This pivotal time during college students' life cycle development presents an opportunity to explore financial behaviors and behavioral influences associated with the students' financial literacy.

Lastly, a review of the literature would be incomplete without acknowledging contributions to research based on the practice of financial literacy programs. Financial literacy is a practical and applied discipline which arose to effectively cope with the societal issue of maintaining one's financial well-being in a capitalist society. In this vein, financial literacy is not only an emerging interdisciplinary body of knowledge, but also an area of professional practice (Chalofsky, 1996; Sims & Jones, 2003). Formalizing knowledge gained in the practice of financial literacy programs has contributed to theory and evidence delineating the foundation for the concept of financial literacy. To acknowledge important contributions resulting from the practice of financial literacy programs, the chapter concludes with perspectives on financial literacy programs. The literature review for the current study was conducted using web-hosted research databases accessed through North Carolina State University's library including ERIC, WorldCat, and Google Scholar.

The purpose of the current study was to evaluate whether college students' financial behaviors and self-efficacy could be used to predict their financial literacy levels. Financial behaviors were evaluated across Lusardi's (2009) typology of four classes of financial transactions: (1) use of traditional sources for borrowing excluding credit cards, (2) use of alternative sources for borrowing, (3) methods of saving, investing and paying and (4) credit

card use. Self-efficacy as a behavioral influence will be evaluated using two types of self-perceived financial ability measures: motivation and self-confidence. Lastly, demographic attributes will be examined for purposes of describing characteristics of the undergraduate college students who participated in the current study.

Three research questions were addressed in this exploration of the predictors of the financial literacy of college students:

1. Does college students' self-efficacy predict their financial literacy?
2. Which financial behaviors predict the financial literacy of college students?
3. Among college students, which demographic characteristics describe who is more financially literate?

Conceptual Framework

The current study used behavioral theory to examine college students' financial behaviors and behavioral influences. Self-Efficacy Theory, situated within Social Cognitive Theory (SCT) was developed as a result of Bandura's efforts to create a refined focus on personal behavioral influences (Bandura, 1986). Expanding the scope of earlier, less complex cause-and-effect behavioral theories, Bandura developed SCT to highlight the role of bi-directional exchanges among influences both internal and external to the individual. SCT's added dimensions of socio-cognitive and social learning influences serve to differentiate it from earlier behavioral theories. Additional background on SCT can be found in chapter 1.

Self-Efficacy Theory

Self-Efficacy Theory was developed to explain a personal behavioral influence that serves to enhance accomplishment and, in turn, personal well-being (Bandura, 1994).

According to Bandura (2003), the capacity to exercise control over the nature and quality of one's life is the essence of humanness. He developed Self-Efficacy Theory to help explain how people become enabled to influence events and to have a hand in shaping their life course. Competency in financial skills and abilities has become imperative for the well-being of consumers in the complex economy of our capitalist society (Lusardi, 2006). For college students, becoming financially literate can help successfully pave a path toward financial well-being starting early in their young adult lives.

Self-Efficacy Theory was developed as a result of Bandura's interest in studying skill mastery and learning experiences. The themes proffered by Self-Efficacy Theory are that self-efficacy is a future oriented, context specific self-assessment of an individual's competence in performing a specific task (Pajares, 1997). Self-efficacy describes the notion that "I can", rather than "I am." Bandura (1986) stated, "Efficacy involves a generative capability in which cognitive, social and behavioral subskills must be organized into integrated courses of action to serve innumerable purposes" (p. 391). Thus, self-efficacy is concerned with self-judgment of an individual's capability to effectively use the skills and abilities she has acquired.

There are four sources of self-efficacy beliefs: mastery experiences, social modeling, social persuasion and physical and emotional state (Bandura & Davidson, 2003). Bandura

viewed skill mastery as the most effective way to build self-efficacy. Mastery experiences are important because a series of successes achieved while mastering a skill help build an individual's self-efficacy. Self-efficacy can be enhanced when people see others like themselves succeed by sustained effort. Referred to as social modeling, Bandura believed that individuals learn vicariously through others who are like themselves. Another way self-efficacy can be enhanced is when people are persuaded by others that they have what it takes to succeed. With social support, individuals can avoid focusing on their doubts when problems arise, and exert more effort toward successful achievement of the task at hand. Bandura referred to this type of persuasion as social persuasion. Being tuned in to one's own physical or emotional state can enhance self-efficacy as well. An awareness of the effects of emotions such as stress or depression, or physical capabilities such as fatigue or chronic illness can help a person better judge the limitations of their capabilities at any point in time.

Self-efficacy comprises four major processes according to Bandura (1994). The first of these is cognitive processes, which refer to courses of action that are organized in thought. Thought processes enable people to predict events as well as to develop ways to control events that affect their lives (Bandura 1994). Cognitive predictive ability requires individuals to effectively engage in cognitive processing in the face of ambiguity and uncertainty:

In learning predictive and regulative rules, people must draw on their knowledge to construct options, to [weigh] and integrate predictive factors, to test and revise their

judgments against the immediate and distal results of their actions, and to remember which factors they had tested and how well they had worked. (Bandura, 1994, p. 73)

Cognitive processes can also be influenced by self-doubt. Significant repercussions can result when a person is faced with pressing situational demands, failures and setbacks. If a person visualizes failure scenarios, she may dwell on the many things that can go wrong, which in turn limits her ability to achieve performance accomplishments (Bandura, 1994). Cognitive processes influence whether people have an optimistic versus pessimistic orientation in their self-efficacy (Bandura, 2003).

A second process of Self-Efficacy Theory is motivation. Bandura (1994) asserts that an individual's motivation is related to ability for self-regulation. Those with lower self-efficacy may find themselves more easily giving up, giving in or settling for mediocrity (Bandura, 1989). Conversely, a high sense of motivational self-efficacy may help keep an individual resilient even in the face of repeated rejections (Bandura, 1989). Motivation applied to the context of self-regulation is comprised of forethought in setting goals, the amount of effort, how long one will persevere, and resistance to failure (Cervone, Artistico and Berry, 2006).

The third process of self-efficacy is affective influences. Affective influences involve emotional factors such as stress, depression and anxiety in conjunction with a person's ability to control these emotions during threatening or difficult circumstances (Bandura, 1989). According to Bandura, in the face of low self-efficacy, individuals may dwell on their inability to control their emotions, which could result in high anxiety arousal, coping

deficiencies, and distress. Ill effects can include impaired thinking or functioning. If a person is not able to cope with or manage her emotions during a difficult time, threats could seem more prominent or she may come to fear her environment (Bandura, 1989). Influenced by emotion, affective processes have an impact on an individual's belief in one's ability to exercise control, cope with problems, mediate anxiety, and ultimately fulfill desired goals (Bandura, 1989).

Selection processes are the last of the self-efficacy processes. Selection processes include both the activities one chooses and which environments one chooses. People tend to naturally avoid activities or social environments they believe are too challenging for their coping abilities (Bandura, 1989). An individual with a more developed selection process might enjoy a broader range of choices because she has cultivated multiple competencies and interests, built social networks and aligned herself in environments in which she can perform more comfortably (Bandura, 1989).

Self-efficacy is the foundation of human motivation and accomplishment (Davidson & Bandura, 2003). People who possess stronger self-efficacy believe they can produce desirable outcomes by their actions, giving them an incentive to act as well as the fortitude to persevere when faced with unfamiliar or difficult challenges under a variety of scenarios. In order to gain a deeper understanding of a behavioral influence that has been associated with motivation and accomplishment, the current study explored the impact that college students' self-efficacy has on their financial literacy levels.

This study explored whether college students believed they were financially literate, and if they did, how that belief was associated with their actual financial literacy levels. Toward that end, the current study's conceptual framework incorporated Self-Efficacy Theory as a form of inquiry into whether college students' beliefs in their financial abilities are associated with their motivation, financial behavioral choices, perceived self-confidence toward functioning well in their financial behaviors, and resilience to adversity when presented with unfamiliar or difficult challenges.

Financial Literacy Models

A number of conceptual models of financial literacy currently exist. However, the more viable models pertaining to the current study specifically addressed financial behavior and/or behavioral influences in relation to financial literacy. Models are of value in research and theory because they provide a visual representation of research frameworks by illustrating concepts and ideas based on a philosophical viewpoint (Creswell, 2009). Models often depict the flow and/or interaction among concepts, giving the reader an active view of how concepts are related.

Four particular models were considered pertinent to the current study because they (1) included financial behaviors and behavioral influences on financial literacy, (2) addressed college students as an important group with distinct and unique needs, or (3) referenced a reframed concept of financial capability. The Hung, Parker and Yoong Conceptual Model of Financial Literacy (2007) provided empirical evidence validating their definition of financial literacy, which includes a focus on financial behaviors. The McQuaid and Egdell Model of

Financial Capability (2010) highlighted the importance of motivation as a behavioral influence on financial literacy and provided background on reframing the concept using alternative nomenclature, financial capability. The Leskinen and Raajas Life Cycle Approach to Consumer Financial Capability (2005) made an important contribution with its focus on college students representing a distinct and important group of emerging adults whose financial needs differ from adults of other age groups, as well as its focus upon financial behaviors. Finally, the Huhmann and McQuitty Conceptual Model of Financial Numeracy (2009) introduced an extensive collection of psychographic influences on financial literacy/financial capability.

This group of four selected conceptual models does not include alternative conceptualizations to financial literacy or financial capability. Among the alternative models is the Shim, Xiao, Barber & Lyons' Student Financial Well-being Model (2009), which focused on the antecedents and consequences of financial well-being in young adulthood. Their model expanded its focus beyond college students' financial literacy to include the young adults' academic success, overall life satisfaction and psychological and physical health as measures of financial well-being.

Conceptual models with a perspective in economics such as consumer behavior were omitted as well. An example of an economics-based model not considered for this study was the Consumer and Financial Literacy Taskforce's (2004) Consumer Behavior Model. The model was created with a consumer economics perspective which focused upon consumers as participatory agents in the economy. The consumer economic perspective has less of a

focus on learning and development of financial literacy or financial capability and a greater focus on the specific influences of behaviors surrounding consumption.

The Hung, Parker & Yoong Conceptual Model of Financial Literacy

The Hung, Parker & Yoong (2009) Conceptual Model of Financial Literacy was developed, in part, in response to critiques regarding the variation that existed in how researchers had defined and measured financial literacy. In research based on the model, Hung, Parker & Yoong empirically validated their definition of financial literacy using reliability measures across three waves of financial literacy tests. Their conceptualization was premised on an understanding of financial literacy as a complex and sophisticated ability which encompassed mutual interaction among relationships of an individual's knowledge, skills and behavior. Hung, Parker and Yoong (2009) underscored the fact that the model was intended to be used in conjunction with their own precise definition of financial literacy.

They offered the following definition of financial literacy: “knowledge of basic economic and financial concepts, as well as the ability to use that knowledge and other financial skills to manage financial resources for a lifetime of financial well-being” (Hung, Parker and Yoong, 2009, p.9). Relationships among financial knowledge, financial skills, perceived knowledge and financial behavior were illustrated in their conceptualization (see Figure 2.1). In the model, feedback loops exist between financial behavior and financial knowledge, as well as between financial behavior and perceived knowledge.

As a means of validating their definition of financial literacy, they developed a construct evaluation across three different waves of financial literacy tests. Each wave

contained a different composition of financial literacy test items. For example, one wave contained a combination of 13 true/false and multiple choice items, another contained 70 true/false items, and the last contained 23 multiple choice items. The three waves of the aforementioned financial literacy tests showed stability when measured using Pearson correlation. Evaluation of the three different tests measuring their concept of financial literacy resulted in acceptable reliability, with Chronbach's alpha scores exceeding the .70 benchmark score indicating good internal consistency (i.e., $\alpha = .76, .71, \text{ and } .88$ all having $p < .001$ respectively).

Figure 2.1. The Hung, Parker & Yoong Conceptual Model of Financial Literacy

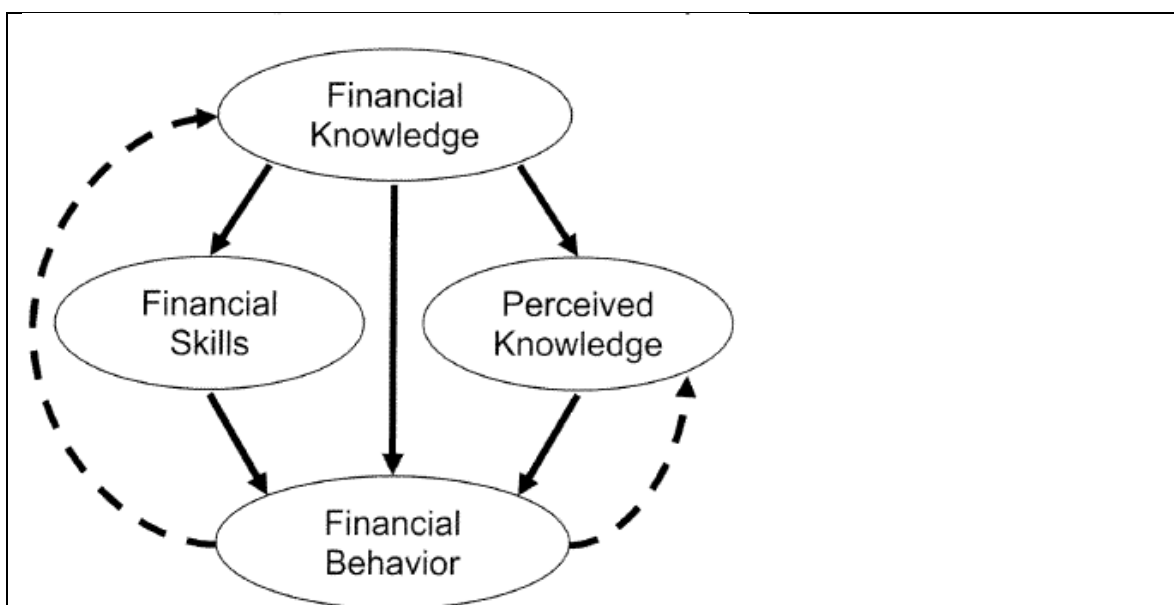


Figure 2.1. Conceptual Model of Financial Literacy. Note. Solid lines with arrows represent flow of influences. Dotted lines with arrows represent feedback loops. Adapted from "Defining and Measuring Financial Literacy" by A.A. Hung, A.M. & J.K. Yoong, 2009, *RAND Working Paper WR-708*, p. 9. Copyright 2009 by the Rand Corporation.

Using financial literacy as a predictor of financial behavior, Hung, Parker and Yoong (2009) found that in a limited domain of savings and investment toward retirement, financial literacy appeared to be a predictor of intended behavior, yet not necessarily associated with actual financial behavioral outcomes. They posited that the nuance between intended financial behavior and financial behavior outcomes may be attributed to contextual factors which have intervening influence in the processes used to translate knowledge and intention into action.

Hung, Parker and Yoong (2009) affirmed with statistical reliability that it is possible to have stability of measurement in waves of tests of the concept of financial literacy. Their examination also revealed that financial literacy is predictive of people's financial planning behavior. The model is influential to the current study's framework for its findings on how financial behavior can be impacted by behavioral influences. The model has not been used in other research investigations beyond Hung, Parker and Yoong's (2009) initial findings.

The McQuaid and Egdell Model of Financial Capability

The McQuaid and Egdell (2010) model of financial capability was important to the current study for two reasons. One reason was based on its reframed concept of financial capability in lieu of financial literacy, and the second reason was based on its focus on motivation as a key behavioral influence on financial capability.

The study of financial literacy is dynamic and evolving in nature. From the 1990s up until around 2008, financial literacy was the term used in the U.S to encompass financial acumen, skills and abilities toward wise and prudent financial behavior and management.

During the same period, the term financial capability was alternatively used in other nations. More recently, beginning in 2009, the U.S Department of Treasury and two of the largest private organizations in the U.S. who sponsor consumer and investor financial education, the FINRA Investor Education Foundation and the National Endowment for Financial Education (NEFE), have adopted the alternative terminology. Financial capability described the sophisticated set of skills, abilities and acumen needed for wise and prudent financial management and behavior. The current study acknowledges this recent shift and the reframing of the concept as financial capability.

Developed in the UK, the McQuaid and Egdell Model of Financial Capability (see Figure 2.2) illustrated the notion that financial capability requires a person to be both effective and confident in the following: (1) management of finances, (2) possessing knowledge and understanding of financial products, (3) informed decision-making, and (4) motivation-driven agentic action.

Figure 2.2. The McQuaid and Egdell Model of Financial Capability

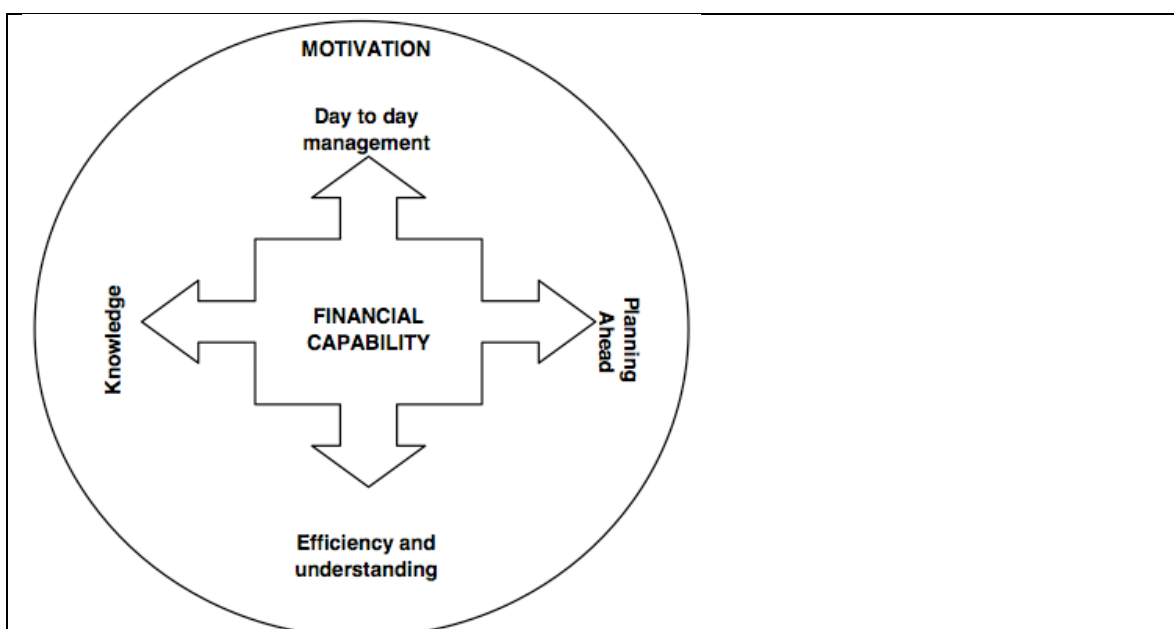


Figure 2.2. Conceptual Model of Financial Capability. Adapted from “Financial Capability – Evidence Review” by R. McQuaid, & V. Egdell, 2010, *Report for the Scottish Government, Employment Research Institute, Edinburgh Napier University, Scotland, April 30, 2010*, p. 6. Copyright 2010 by the Employment Research Institute.

The model was premised on the HM Treasury’s definition of financial capability as follows:

Financial Capability encompasses people’s knowledge and skills to understand their own financial circumstances, along with the motivation to take action. Financially capable consumers plan ahead, find and use information, know when to seek advice and can understand and act on this advice, leading to greater participation in the financial services market. (as cited in McQuaid & Egdell, 2010, p. 5) McQuaid and Egdall asserted that possessing the motivation to take action toward efficiently managing finances and effecting change is integral to developing and maintaining one’s financial

capability. Without motivation to take action, individuals may end up paying more for goods and services they need, risk entering financial agreements whose terms they cannot uphold, or may be hindered from coping with unexpected changes and become vulnerable to financial abuse from others.

There are no existing research studies using McQuaid and Egdall's (2010) conceptual model of financial literacy. The model is of interest to the current study for its emphasis on motivation, a behavioral influence, as it relates to the development of acumen, skills, and abilities toward achieving financial capability. The reframing of the concept of financial literacy as financial capability in this conceptualization served to inform the current study as well.

The Leskinen and Raijas Life Cycle Approach to Consumer Financial Capability

Leskinen and Raijas' (2005) model was based on a life cycle approach, which adds value to the current study based on its consideration of an individual's growing and changing financial needs over the life cycle course. Four distinct groups were identified in their life cycle approach to financial literacy: children, emerging adults (i.e. 18 to 25 year olds), adults in the workforce and retirees. With the exception of emerging adults, the remaining three groups were not delineated by age.

In younger years, children are dependent on others for financial subsistence. During emerging adult years, ages 18 to 25, college students are learning to become financially independent while also seeking higher education, getting married and starting families of their own. Experience with indebtedness is a certainty during emerging adult years, a time at

which lower income does not always meet demands of consumption expenditures. In the next life cycle phase, adults enter the workforce full time, achieving income levels that can allow them to manage debt successfully while simultaneously saving for future expenditures such as children's education funds, new homes, and retirement savings. Finally, adults retire from the workforce with generally lower income and consumption levels. During these life cycle transitions, different and/or progressively more complex financial capabilities are required to make informed, wise and prudent choices (Leskinen & Raijas, 2005; Lusardi, 2006; Mandell, 2009).

Leskinen and Raijas (2005) also used a reframed concept of financial capability in lieu of financial literacy. The authors consider financial capability as consisting of a set of the individual's personal characteristics influenced by various factors in her/his micro and macro environment (Leskinen & Raijas, 2005). This understanding was intended to include the notion that an individual possesses certain emotional, cognitive, social and material resources, of which she must maintain awareness to utilize those resources to her advantage.

The Leskinen and Raijas conceptualization of financial capability also incorporated dynamic influences from four main sectors of society. The main sectors of society included, the public sector, market sector, household sector and third (i.e., citizen) sector. Figure 2.3, Leskinen and Raijas' model of the Dynamics of Household Economic Activities and Consumer Finances provided an illustration of the interactive role of the forces on a consumer household. For example, success, or lack thereof, surrounding one's financial

capability can ultimately impact members of one's family, neighborhood, and members of the broader community.

Figure 2.3. Dynamics of Household Economic Activities and Consumer Finances

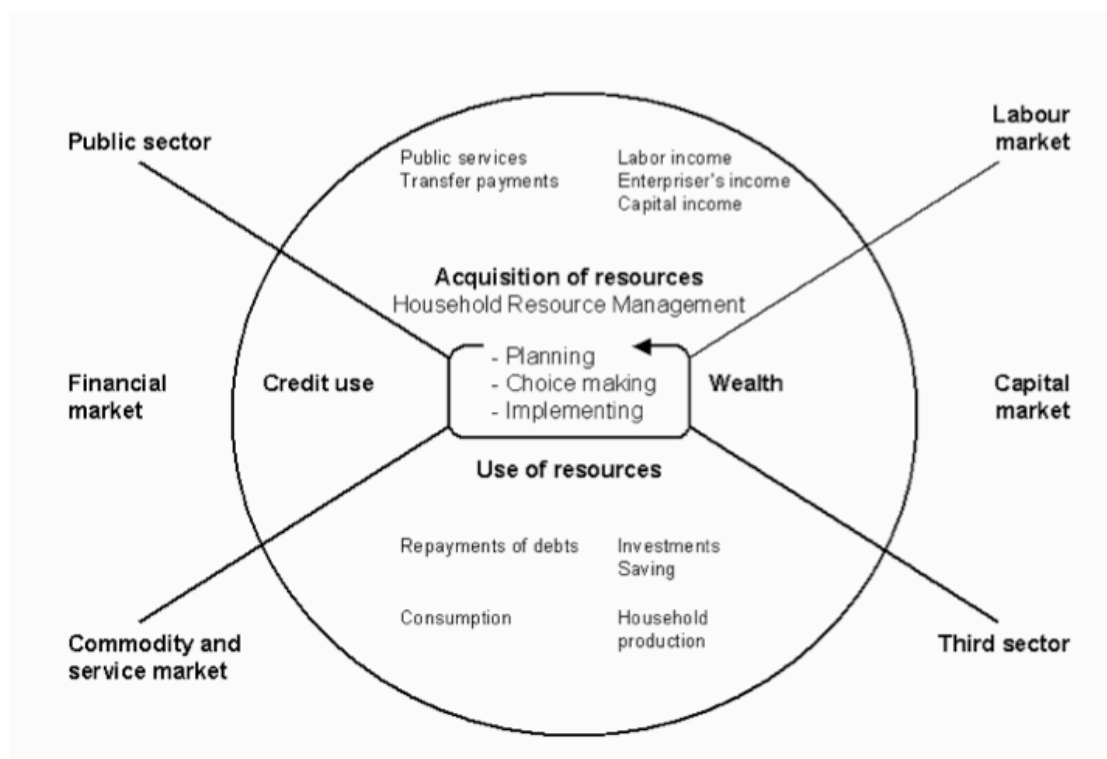


Figure 2.3. Dynamic interaction between the main sectors of society: the public sector, market sector, household sector and third (i.e., citizen) sector. Adapted from “Consumer financial capability: a life cycle approach,” by J. Leskinen and A. Raijas, 2005, in *European Credit Research Institute, Brussels (Ed.), Consumer Financial Capability: Empowering European Consumers, Consumer Financial Capability Workshop*, Brussels, Belgium, November 8, 2005, p. 6. Copyright 2005 by the European Credit Research Institute.

The model is bounded by a definition of financial capability that emphasized both the depth and breadth of the concept. Breadth referred to products and services from the actors in the national economy, including financial institutions and the government. Financial institutions referred to investing, banking and lending services, and tax policies initiated by

the government. Depth referred to influences such as financial knowledge and understanding, skills and competence toward everyday financial management, and financial responsibility, and how these influences directly impacted the individual's financial behaviors. Depth also involved society by taking into account household members, and as well as the broader community who are ultimately impacted by financial interactions among the many actors in the national economy. The intention of the Leskinen and Raijas (2005) model was to illustrate that financial capability is a process that evolves over a person's life cycle, following current trends and activities in society, with both direct and indirect influences from society's social, economic and cultural influences.

There were no known studies using the Leskinen and Raijas Life Cycle Approach to Consumer Financial Capability (2005) in existence at the time of the current study. Their conceptualization was important to the current study in two ways, first, in its focus on the evolving nature of financial capability needs throughout the life cycle. Undergraduate college students, as emerging adults, are vulnerable to developing poor financial practices during the transition period to becoming financially independent adults. Second, it addressed the reframed concept of financial capability, terminology for which as of 2009 had also been adopted in the U.S as a replacement nomenclature denoting the concept of financial literacy.

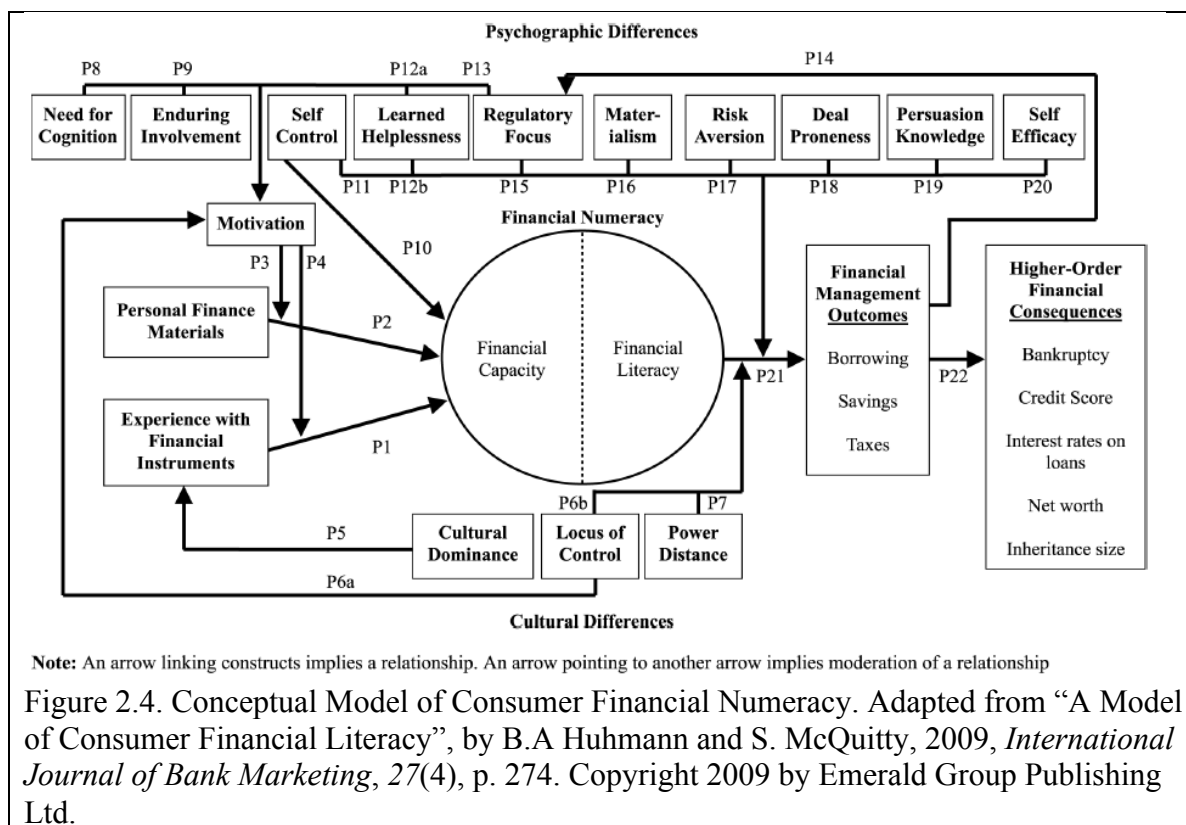
The Huhmann and McQuitty Conceptual Model of Financial Numeracy

The final model developed by Huhmann and McQuitty (2009) represents a comprehensive model of consumer financial numeracy. The term financial numeracy placed a particular emphasis on abilities of comprehending and using numbers, mathematical concepts and mathematical methods in becoming financially proficient. Under this conceptualization, there was a focus on how consumers process information, how consumers learn, and integrate prior knowledge toward taking action in financial management, financial decisions and financial behavior.

In the model (see Figure 2.4, the Huhmann and McQuitty Conceptual Model of Financial Numeracy), the concept of financial numeracy was split into two distinct components: (1) financial literacy, involving knowledge and understanding of financial concepts and products, and (2) financial capacity, involving the ability to process, comprehend and take action regarding financial matters. Also depicted are both antecedents and consequences of financial numeracy.

Eleven psychographic influences related to learning and development were part of this model. They included: need for cognition, enduring involvement (i.e, duration of commitment), self-control, learned helplessness, [self]-regulatory focus, materialism, risk aversion, deal proneness, persuasion knowledge, self-efficacy and motivation. The model highlighted the role of financial experiences, along with the sources and availability of financial education materials as important influences for building financial capability.

Figure 2.4. The Huhmann and McQuitty Conceptual Model of Consumer Financial Numeracy



Not surprising, the Huhmann and McQuitty (2009) Conceptual Model of Consumer Financial Numeracy is yet to be used in research investigations. One problematic aspect of the model is the large number of variables it incorporates. Capturing and measuring such a vast array of variables could prove difficult. Also, the model’s main concept, financial numeracy is a bisected concept inclusive of both financial literacy and financial capability. This bisection was not seen elsewhere in financial literacy research, and again, could complicate quantitative measurement. McGregor (2011) cites the model’s value to the research community – particularly with regard to its focus on self-confidence. Bearden,

Hardesty, and Rose 2001 define consumer self-confidence as “the extent to which an individual feels capable and assured with respect to his or her marketplace decisions and behaviours” (as cited in McGregor, 2011, p. 346). The Huhmann and McQuitty model was of interest to the current study based upon its emphasis on self-efficacy as a behavioral influence associated with financial literacy/financial capability.

Summary of Financial Literacy Models

Reviewing models of financial literacy provided insight into how past researchers have conceptualized the phenomenon. Review of the aforementioned models established some common themes. All four models included behaviors and/or behavioral influences as having a central role in contributing to the development of financial literacy/capability. Two of the models, the McQuaid and Egdell Model of Financial Capability (2010) and the Huhmann and McQuitty Conceptual Model of Financial Numeracy (2009), highlighted the role of motivation in developing knowledge, skills and abilities toward becoming financially literate/capable. The Huhmann and McQuitty Conceptual Model of Financial Numeracy specifically addressed self-efficacy’s influence on financial literacy/capability.

None of the conceptual models in this review have been used for research investigations involving college students. The basis of most research in the financial literacy of college students has been of a practical nature, based on educators’ experiences in program practice or with financial literacy and/or financial capability policy or legislative issues. The current study has noted the fact that the four financial literacy conceptualizations in the literature review reflect the importance of financial behavior and behavioral influences

on financial literacy. Acknowledging common themes in conceptual models, the current study isolated the role of financial behaviors and behavioral influences using a unique conceptualization of financial literacy based in Self-Efficacy Theory.

Selected Studies in the Financial Literacy of College Students

The current study's research review presents 12 selected studies in the financial literacy of college students. Rationale for including the selected studies was based on several contextual similarities with the current study. Each of the 12 selected studies maintained a focus on the concept of financial literacy. Each of the selected studies targeted the college student population. Each used a test of financial literacy to assess college students' financial knowledge, skills and abilities. Each of the studies used quantitative methodology to gather and evaluate empirical evidence associated with college students' financial literacy levels.

Research not focused on the college student population was omitted from the review, as were studies that did not involve use of financial literacy tests. Studies not using quantitative methodology were omitted as well. Also omitted from the group of twelve selected studies were other research investigations focused on alternative concepts to college students' financial literacy. Studies in college students' financial well-being represent an alternative concept omitted from the review (Gutter & Copur 2011; Xiao, Tang & Shim, 2009). The concept of financial well-being differs from the concept of financial literacy in that financial well-being encompasses psychological adjustment, physical health, academic success and overall life satisfaction. Research based on a second alternative concept, financial socialization (Norvilitis & MacLean, 2009; Shim, Barber, Card, Xiao, & Serido,

2010), was omitted. Financial socialization differs from the concept of financial literacy in that financial socialization focuses on influential relationships on college students' financial learning by parents, peers, teachers and employers.

The current study's research review examined findings of 12 contextually similar quantitative studies in the financial literacy of college students (see Table 2.1, Selected Studies in the Financial Literacy of College Students: 2003 – 2013). In conducting a research review of the 12 selected studies in the financial literacy of college students, two key areas of variation in the studies were apparent. First was variation in defining the concept of financial literacy. Second was variation among the test instruments used to measure college students' financial literacy levels.

Financial Literacy Definitions

So sophisticated and complex is the concept of financial literacy that it has presented challenges for researchers in defining, delimiting, testing and measuring the concept. Financial literacy has been a dynamic concept influenced by fluid and changing economic conditions, global influences, and financial markets and institutions in the U.S. The dynamic influences on financial literacy can be seen in the recent shift in understanding resulting in the reframing of the concept as financial capability in conceptual models.

Challenges are inherent in reigning in such an expansive concept (Huston, 2010). The concept of financial literacy overlaps several different fields of study. It has been an important topic of interest to scholars of education, consumer behavior, public policy and sociology. These scholars have provided varied perspectives and viewpoints influential

Table 2.1. Selected Studies in Financial Literacy of College Students: 2003 – 2013

	Research Topic	Financial Literacy Concept: Dimensions	Test Instrument	Statistical Technique(s)
Avard, Manton, English & Walker; 2005	Financial knowledge of college freshmen	Financial Literacy: Planning; saving; borrowing; investing; insurance and taxes.	Customized 20-question test	Frequency distributions
Beal & Delpachitra; 2003	Financial literacy of Australian university students	Financial Literacy: Basic concepts; markets and instruments; planning; analysis and decision-making; insurance.	Customized 25-question test	Logistic Regression
Borden, Lee, Serido & Collins; 2007	Impact of seminars on college students' financial knowledge, attitudes & behavior	Debt Literacy: Debt practices; attitude toward credit; financial behaviors	Customized 25-question test	T-test, ANOVA
Cude, Lawrence, Lyons, Metzger, LeJeune, Marks & Machtmes, 2006	College students' financial literacy	Financial Literacy: Financial practices used for checking account; credit cards; budgeting; saving.	Customized 10-question test	Multiple regression
Eitel & Martin, 2009	First-generation female college students' financial literacy and perceived needs	Financial Literacy: Income; money management; saving and investing; and spending and credit	Jump\$tart 31-question test	Multiple regression
Lyons, 2007	Credit practices of Midwest college students	Debt Literacy: Credit card practices, loans and financial aid, financial education	Customized 25-question test	Measures of central tendency

(Table 2.1 continues)

(Table 2.1 continued)

Authors	Research Topic	Financial Literacy Concept: Dimensions	Test Instrument	Statistical Technique(s)
Mandell, 2008	Personal financial literacy among young American adults	Financial Literacy: Income; money management; saving and investing; and spending and credit	Jump\$tart 31-question test	Measures of central tendency
Murphy, 2005	Financial literacy of black college students	Financial Literacy: Income and expenses, interest rates and loans, long-term savings, social security and taxes	Customized 10-question test	Logistic regression, ANOVA
Norvilitis, Merwin, Osberg, Roeling, Young & Kamas, 2006	Money attitudes, financial knowledge & credit card debt of college students	Financial Literacy: Income; money management; saving and investing; and spending and credit	Jump\$tart 31-question test	Multiple Regression
Peng, Bartholomae, Fox & Cravener, 2007	Impact of personal finance education delivered in high school & college	Investment Literacy: Types of investment instruments, interest rates, risk and return, insuring investments.	National Association of Securities Dealers 10-question test	Multiple regression
Rosacker, Ragothaman & Gillispie, 2009	Financial literacy of freshmen business school students	Financial Literacy: Income and spending, saving, retirement, investing and taxes.	Customized 13-question test	T-test
Syedian & Yi, 2011	Improving financial literacy of college students via educational intervention	Financial Literacy: Income; money management; saving and investing; and spending and credit.	30 questions from the Jump\$tart test, plus 8 from other sources	Multiple Regression

in defining the concept of financial literacy. Historically, financial literacy definitions came from policy makers or experts in the field of financial management (Remund, 2010). A wide array of definitions for financial literacy arose with the development of studies focused on college students' financial literacy.

Considerable variation among the definitions of financial literacy was present while examining key studies of college students' financial literacy. Twelve studies were found to be most closely aligned to this investigation. In examining these studies, some were limited to specific domains or subsets of financial activity such as investing (Peng, Bartholomae, Fox & Cravener, 2007) or college students' credit card use (Lyons, 2007; Norvilitis et al., 2006). Other studies used a broader concept of financial literacy that encompassed several factors relating to a sophisticated spectrum of financial skills, abilities and knowledge such as, budgeting, saving, borrowing and investing. Three of the studies referenced at least two different definitions of financial literacy (Beal & Delpachitra, 2003; Cude et al., 2006; Rosacker, Ragothaman & Gillispie, 2009).

Cude et al. (2006) cited three distinct yet comprehensive definitions for financial literacy. These definitions included: Mason & Wilson (2002), Vitt (2000), and Hogarth (2002). The Mason & Wilson (2000, p. 103) definition states, “[financial literacy] is a meaning-making process in which individuals use a combination of skills, resources, and contextual knowledge to process information and make decisions with knowledge of the financial consequences of that decision.” The second definition cited by Cude et al. was the Vitt et al. definition, which was used in the current study:

[Financial Literacy is] the ability to read, analyze, manage and communicate about personal financial conditions that affect material well being. It includes the ability to discern financial choices, discuss money and financial issues without (or despite) discomfort, plan for the future, and respond competently to life events that affect everyday financial decisions, including events in the general economy (Vitt et al., 2000, p. 2).

The Hogarth definition represents the third definition and proffers that individuals who are financially literate “[are] 1) knowledgeable, educated, and informed on the issues of managing money and assets, banking, investments, credit, insurance, and taxes; 2) understand the basic concepts underlying the management of money and assets; and 3) use that knowledge and understanding to plan and implement financial decisions” (Hogarth, 2002, pp. 15-16).

Among the three definitions cited by Cude et al. (2006), the Mason & Wilson (2000) definition placed greater emphasis on cognitive processes and abilities, versus delineating specific skills in financial domains. Both Vitt et al. (2000) and Hogarth’s (2002) definitions detailed skills, knowledge abilities and also integrated behavioral and cognitive abilities such as applying knowledge to changing conditions. Vitt et al’s definition included an additional dimension not found in the other two definitions. She referred to specific intervening behavioral influences by addressing the capability of people to discern or discuss finances so as to be free of discomfort, and/or possess the fortitude to work through their discomfort. These behavioral influences predominantly represent self-efficacy, which is used for the

conceptual framework of the current study. Among the 12 selected studies of college students' financial literacy, the Cude et al. study was the only other study citing Vitt et al.'s financial literacy definition.

Researchers have yet to reach consensus on a universal definition of financial literacy (Huston, 2010; Remund, 2010). Lack of a universally accepted definition has led to variation in how the concept of financial literacy has been defined. Attempts have been made to develop a universal conceptual definition of financial literacy. Based on synthesis of the literature, Remund explicated the following conceptual definition of financial literacy:

Financial literacy is a measure of the degree to which one understands key financial concepts and possesses the ability and confidence to manage personal finances through appropriate, short-term decision making and sound, long-range financial planning while mindful of life events and changing economic conditions. (2010, p. 284)

His conceptualization, drawn from synthesis of definitions in the literature, is strong and appears to move the effort forward toward a universal definition of financial literacy. Continued efforts toward establishing and adopting a universal definition could help to reduce variation in how the concept of financial literacy is defined (Huston, 2010).

Beyond these scholarly efforts, in 2011, the Financial Literacy and Education Commission (FLEC) developed a framework titled, "Promoting Financial Success in the United States: National Strategy 2011", to provide the foundation for a national financial education strategy in the U.S. Contained within this framework were five core competencies

of financial education identified by the U.S Treasury. The five competencies included: (1) earning, which involves various aspects related to a paycheck; (2) spending, which involves aspects of learning to live within one's means by tracking spending; (3) saving, which includes basic understanding of banking and financial assets; (4) borrowing, which includes aspects of credit such as awareness of debt obligation including interest rates and credit scores; and (5) protection, which includes knowing how to protect your financial assets and understanding insurance and fraudulent scams. FLEC's 2011 national strategy served to provide a consistent framework for defining financial literacy as well as delineating financial literacy factors.

Financial literacy factors. Financial literacy factors represent key areas or dimensions of financial literacy and are dependent upon how the researcher has defined the concept. In addition to FLEC's five core competencies, two different approaches were used historically to establish financial literacy factors. A third statistics-based approach, factor analysis, is yet to be used in research establishing financial literacy factors.

To date, the most common method for delineating financial literacy factors involved the creation of logical groupings to represent the factors. The logical groupings were derived based on content areas of items on tests used to measure financial literacy. For example, the four financial literacy factors of income, money management, savings and investing, and spending and credit were identified based on logical groupings of the Jump\$tart Coalition for Financial Literacy's test items (Lucey, 2005). Other methods existed for delineating financial literacy factors.

Another method of delineating financial literacy factors arose based on attempts to operationalize the concept of financial literacy for testing and measurement purposes. Based on an extensive review of financial literacy test instruments used by government organizations, consumer organizations, and in scholarly research, Remund delineated the factors by identifying the four categories most commonly used to operationalize the concept of financial literacy. Remund (2010) suggested four content areas or factors for delineating and/or operationalizing the concept of financial literacy: budgeting, saving, borrowing, and investing. With FLEC's 2011 National Strategy for promoting financial success in the U.S., there were five core financial competencies defined: earning, saving, spending, borrowing and protection.

Finally, financial literacy factors can be determined using statistical procedures. One weakness of financial literacy research is that factor analysis of the concept of financial literacy is yet to be performed. In statistics, a factor is defined broadly as “an underlying construct or variable that helps explain the correlations between several tests or measures” (Gregory, 2011, p. 586). In research, factor analysis uses correlation as a structure detection method to determine dimensions of a concept. According to Gregory, factor analysis is essential to the validation of many ability tests. In addition to delineating dimensions of a concept, factor analysis provides a measure of construct validity for test instruments and will be discussed further in the next section.

Financial Literacy Tests

Financial literacy tests represented a second key area of variation among the 12 selected studies in the financial literacy of college students. Financial literacy tests provide an assessment of college students' financial knowledge, skills and ability in the form of a percentage of successful responses to test items. The test scores are then used to make inferences about college students' financial literacy. Variations among financial literacy tests used in the 12 selected studies in the financial literacy of college students included: test format and number of test items, pilot testing and test item construction, reliability and validity.

Test background. Currently there are no standardized financial literacy tests for college students. However, financial literacy test construction has been influenced by the Jump\$Start Coalition for Personal Financial Management. This influence is based on Jump\$Start's experience testing nearly 23,000 K-12 students from 1997 through 2008 (Mandel, 2009). In 2008, in one of the larger research studies examining the financial literacy of college students, Jump\$Start tested 1,030 full-time college students. Jump\$Start represented a diverse coalition of financial education stakeholders who worked together to educate and prepare youth in the U.S. for life-long financial success (www.jumpstart.org). In 1999, the Jump\$Start coalition published their original National Standards for K-12 Personal Financial Education. Working with the Jump\$Start coalition, Dr. Lewis Mandell helped develop and administer biennial financial literacy tests to K-12 students beginning in 2000

(Mandell, 2009). In 2008, Dr. Mandell further expanded Jump\$Start coalition-sponsored financial literacy testing to include college students.

Test format. Financial literacy tests have typically used a multiple choice format, in which each question or statement has one correct response choice accompanied by three incorrect response choices. A multiple choice format was used in 11 of the 12 selected studies in the financial literacy of college students. Cude et al. (2006) used a test format that diverged from the multiple choice format. Financial fitness of college students was measured using 10 Likert scale items capturing the frequency with which students engaged in certain financial management practices (Cude et al., 2006). Responses were captured using a 5-point scale to record the students' frequency of financial practices where 1 = always ascending to 5 = never. To critique the Cude et al. format, Gregory (2011) suggested that the technique of choice for group administered tests of knowledge and achievement is the multiple-choice question. Further, a test limited to 10 items could only measure certain aspects of financial literacy, a complex and evolving concept.

Number of test items. There is debate surrounding the number of test items appropriate for measuring the concept of financial literacy (Huston, 2010; Lucey, 2005). Four of the 12 selected studies in the financial literacy of college students used the Jump\$Start coalition's 31-item financial literacy test (Norvilitis, Merwin Osberg, Roeling, Young & Kamas, 2006; Mandell, 2009; Eitel & Martin, 2009; Seyedian & Yi, 2011). The remaining eight of 12 selected studies in the financial literacy of college students used a customized financial literacy test with number of test items ranging from 10 to 25. The customized tests

were based upon research objectives particular to each study's definition of financial literacy, as well as on the study's financial literacy dimensions or factors (see Table 2.1).

Among studies that used a customized financial literacy test, two of the studies used tests containing a limited number of 10 test items. (Murphy, 2005; Peng, Bartholomae, Fox & Cravener, 2007). The Peng et al. study used a test instrument authored by the National Association of Securities Dealers (NASD). The smaller set of test items used in their study was related to the single factor, investment literacy, which is a subset of the broader concept of financial literacy related specifically to investing activities. The Murphy (2005) study used 10 items to measure the broader concept of financial literacy, which is too few to test a concept as sophisticated and complex as financial literacy (Huston, 2010).

Even JumpStart's financial literacy test, containing 31 test items, has been criticized for having an insufficient number of items (Lucey, 2005). Lucey based his observation on the fact that Jumpstart's Personal Financial Management Guidelines (1999) contain 49 benchmarks for high school seniors. The number of benchmarks still exceeded the number of test items, even after accounting for overlapping financial areas based upon Lucey's comparison of the benchmarks in the JumpStart's guidelines versus their financial literacy test items.

Stopping short of suggesting a specific number of test items for the concept of financial literacy, Huston (2010) provided guidelines for creating a sufficient number of test items. She cited Kim and Muller's (1978) rule of thumb that the minimum number of items having meaningful loadings on a factor is typically between three and five. Huston's meta-

analysis of 71 individual studies identified four factors of financial literacy: basic concepts, borrowing concepts, saving/investing concepts, and consumer protection concepts. With four factors identified and three to five items needed to have meaningful loadings, Huston suggested the minimum number of financial literacy test items would fall between 12 and 20. Alternatively, if FLEC's five core competencies are used, the minimum number of financial literacy test items would fall between 15 and 20. The debate on the correct number of test items continues. Researchers face a struggle in test construction to find a balance between having a sufficient number of items to encompass a complex topic, and to maintaining brevity so as not to overwhelm the respondents (Beal & Delpachitra, 2003).

Pilot testing and test item construction. Pilot study testing and test item construction was one of the weaker areas among the 12 selected studies in the financial literacy of college students. Eleven studies made no mention of a pilot study of their financial literacy test instrument. One of the research investigations was a pilot study (Borden, Lee, Serido & Collins, 2008). Among the 12 selected studies, no mention was made of an original pool of test items or which test items had been revised or discarded as a result pilot study testing.

To help evaluate usefulness of test items, two different indices for each test item can be evaluated, item discrimination and item difficulty indices. The item discrimination index can be used to help determine how efficiently a particular test item discriminates between persons who obtain high and low scores on the entire test. The item discrimination index is measured as a decimal number ranging from -1.0 to +1.0. Its calculation is based on an

evaluation of correct responses to each test item by examinees whose overall test score falls in the upper 25% versus correct responses by examinees whose overall test score falls in the lower 25%. An optimal item discrimination index should be greater than zero. An item discrimination index of -1.0 would indicate that all of the examinees whose overall test score is in the lower 25% responded correctly to the test item, while all of examinees whose overall test score is in the upper 25% responded incorrectly. The item discrimination index indicates a test item has poor quality if all of the top performing examinees responded incorrectly while all of the bottom performing examinees responded correctly (Gregory, 2011).

A second index, item difficulty, can be used to determine the proportion of examinees who respond correctly to a particular test item. The item difficulty index is measured as a decimal number on a scale of zero to one. An optimal item difficulty index should fall in the range of 0.2 to 0.7. An item difficulty of zero would indicate none of the examinees responded correctly. The researcher should consider rewriting or discarding test items with an item difficulty index of zero (Gregory, 2011).

These two indices can be used during pilot study testing to help the researcher decide whether to keep, revise or discard particular test items. Neither item discrimination nor item difficulty indices of test items were reported for the 12 selected studies in the financial literacy of college students.

Reliability. Another important aspect of test construction was reliability, or the consistency of measurement attributable to a test. Reliability has been cited as important evaluative measure indicating whether a test consistently measures what it purports to

measure (Gregory, 2011; Litwin, 2003; Lucey, 2005). The coefficient alpha (i.e. Chronbach's) measure of reliability has traditionally been used for measuring internal consistency of test items by assessing inter-correlation between test items. Lucey's (2005) assessment of the reliability of the JumpStart coalition's financial literacy test exemplified the process of empirical evaluation in test construction. Lucey reported JumpStart's financial literacy test as having acceptable reliability with an adjusted coefficient alpha of .74. None of the remaining eight of the 12 selected studies in the financial literacy of college students using a financial literacy test other than the JumpStart coalition's test reported a reliability coefficient for the financial literacy test used.

Validity. According to Gregory (2011, p. 110) "A test is valid to the extent that inferences made from it are appropriate, meaningful and useful." A few different techniques have been used for measuring validity traditionally in empirical studies. More commonly reported validity measures have included face validity, construct validity and predictive validity. All 12 of the selected studies in the financial literacy of college students reported face validity. Seven of the 12 selected studies reported predictive validity through use of a regression equation. None of the 12 selected studies reported construct validity.

Face validity. Face validity was the strongest area of validity assessment among the 12 selected studies in the financial literacy of college students. Every one of the researchers reported either soliciting test items directly from professors of finance, economics, or law or having consulted those professors regarding the test items used. Face validity is not viewed

as a technical criterion-based validity measure, yet it nonetheless adds value based on subjective opinions of scholarly experts.

Predictive validity. Predictive validity was another stronger area of validity assessment among the 12 selected studies in the financial literacy of college students. Predictive validity is a type of concurrent validity measure based upon the fact that the predictive validity measure is obtained at the same time as the test scores. Predictive validity is measured by means of a regression equation. The most common statistical technique used to evaluate results of survey-based studies in the financial literacy of college students has been regression analysis. Seven of the 12 selected studies in the financial literacy of college students used regression analysis as a measure of predictive validity. The remaining five studies used inferential models, frequency distributions and measures of central tendency.

Two of the studies used regression models for predicting a limited concept of financial literacy. The Norvilitis et al. (2006) model predicted the onset of college students' credit card debt. Their model yielded five predictors statistically significant which included: number of credit cards held, age, delay of gratification, credit card use, and financial literacy test score. Unique to the Norvilitis et al. model was the fact that the dependent variable, or what was being predicted, was not college students' financial literacy test scores; instead, it was the onset of debt. In contrast with other models in the 12 selected studies of college student financial literacy, Norvilitis et al. (2006) chose to use the students' financial literacy test score as one of the predictor variables.

A second regression model with a limited concept of financial literacy examined investment literacy (Peng, Bartholomae, Fox & Cravener, 2007). Investment literacy, derived from a 10 question test, included experience with saving, knowledge of investment vehicles, awareness of investing risks, understanding interest rates and return on investments, and knowledge of insurance and security of investments. Six variables in the regression model were statistically significant in association with investment literacy test scores. These variables included: having taken a college class in finance, holding a bank account before age of 18, currently owning a stock or bond, as well as income level, occupation and gender.

Three of the 12 selected studies in the financial literacy of college students incorporated regression models where the dependent variable addressed a broader, more encompassing concept of financial literacy. A regression model predicting the financial literacy of Australian university students (Beal & Delpachitra, 2003) found there were two statistically significant predictors, male gender and higher income levels associated with higher college student financial literacy test scores. Murphy's (2005) study created a regression model of the predictors of financial literacy of students at a predominantly black university revealing that black ethnicity negatively impacted the college students' financial literacy test scores. A third study's regression model of the predictors of financial literacy among first generation female college students (Eitel & Martin, 2009) resulted in finding the variables of higher age, Caucasian ethnicity and higher class rank to be associated with higher student financial literacy test scores (see Appendix A, table A5). The regression models from these three studies have revealed important information regarding student

attributes which can impact college students' financial literacy test scores in a positive way: male gender, higher income, higher age, higher class rank, Caucasian ethnicity. In the context of a predominantly black college, also revealed was the predictor variable of black ethnicity impacting college students' financial literacy test scores negatively.

For the final predictive regression model, Seyedian & Yi's (2011) cross-sectional study provided a stronger quantitative evaluation versus the single survey method used across the eleven other selected studies in the financial literacy of college students. Seyedian & Yi's (2011) study was unique in its use of an educational intervention in financial literacy for students. Seyedian & Yi (2011) created three different regression models, all having financial literacy test scores as the dependent variable, each comprising a different set of predictor variables. Their unique approach to regression modeling was not seen in any of the other studies. One of their regression models examined student demographic variables and yielded employment history and parents' highest level of schooling as statistically significant in association with the higher student financial literacy test scores. A second model incorporated variables depicting financial experiences of the students. Results of the second model indicated that key factors of 1) experience owning credit cards, 2) verifying every checking account transaction while never having bounced a check, and 3) not verifying every checking account transaction while having bounced a check are statistically significant in association with the higher student financial literacy test scores. The third model incorporated variables depicting financial attitudes and behavior of the college students. Seyedian & Yi's third regression model indicated that believing it would be tough to live on

social security when older without much money saved was statistically significant in association with the higher student financial literacy test scores.

Construct validity. Lastly, construct validity was the weakest area of validity assessment among the 12 selected studies in the financial literacy of college students. None of the 12 selected studies in the financial literacy of college students reported construct validity. One method of measuring construct validity is through factor analysis. Factor analysis uses correlation as a structure detection method to determine dimensions of a concept. Researchers have used factor analysis to identify the minimum number of dimensions (i.e., factors) to account for an observed array of inter-correlations among individual tests (Gregory, 2011). Mentioned in the section above regarding challenges in operationalizing conceptual definitions of financial literacy, factor analysis could prove helpful in delineating the key factors associated with financial literacy. Not only would construct validity measures resulting from factor analysis serve to verify the application of inferences made about the underlying concept of financial literacy, the resulting factors could also be used to standardize a quantitatively verifiable definition of financial literacy.

Summary of Selected Studies in the Financial Literacy of College Students

In the current study's research review, 12 selected studies in the financial literacy of college students were reviewed to highlight current understandings of the concept. Two key areas of concern in college student financial literacy research were identified: variation in financial literacy definitions and variation in tests of financial literacy. These concerns informed the current study in two important ways. First, selection of a definition that is

consistent with the study's conceptual framework was vital to the inferences that would result from the study. Second, construction of a financial literacy test instrument could be greatly enhanced through rigorous review of test format, number of test items, pilot testing and test item construction, reliability and validity measures.

Financial Literacy Programs

Similar to human resource development in the workforce, financial literacy has been largely a practical-based and applied discipline. Early programs were developed to help individuals cope with personal financial issues and challenges inherent in the pursuit of financial well-being in a capitalist economy. In the historical context of financial literacy programs, immediacy of problem solving and the financial well-being of learners left little time for financial literacy program planners to focus on creating theoretical or conceptual constructs specific to financial literacy. Historically, research was more often informed by developments in financial literacy program practice.

Historical Context of Financial Literacy Programs

Beginning in the early 1900s, financial literacy programs in America were offered primarily by non-profit organizations, typically in community settings where financial literacy was often part of adult basic education programs for new immigrants and for those of lower socio-economic status. Early financial literacy programs had very basic objectives: to prepare workers for employment and to help empower individuals with proficiencies required to effectively perform everyday financial transactions. Dating back to 1908, credit unions were an example of early providers of financial literacy programs (Credit Union

National Association, 2002). Over the next four decades, through the 1950s, sponsorship of financial literacy programs continued largely through the efforts of non-profit and community organizations including community centers, libraries and churches.

Coinciding with Post World War II economic expansion and the Civil Rights movement in the U.S., objectives of financial literacy programs grew and were influenced by changes in the U.S. economy. The 1960s brought change in the form of government policy and the advent of government-sponsored financial literacy programs. The 1960s were a decade that saw the passage of the both the Economic Opportunity Act (1964) and Adult Education Act (1966). Passage of these types of legislation marked the beginning of broader national and federal support for consumer and economic education initiatives, such as HUD-sponsored home-ownership programs. Economic events during the 1970s gave rise to a lengthy recession in the U.S where high inflation, exorbitant oil prices, and skyrocketing home loan rates began to seriously impact the financial well-being of many Americans. Pressing economic difficulties of the 1970s spurred further support from national and federal organizations to make financial literacy programs available to educate the American public, with a focus on developing skills and abilities for maintaining financial well-being during challenging economic times (Evans, 2009). The National Endowment for Financial Education (NEFE), founded in 1972, was the first educational institution dedicated to financial planning. During the 1980s, the Federal Reserve Bank took the initiative to create financial education programs that were focused on consumer rights and lender responsibilities (Evans, 2009). The 1960s through the 1980s was a period when government

agencies and federally funded education providers began offering financial literacy programs, supplementing initial efforts of community-based and not-for-profit organizations.

Contemporary Context of Financial Literacy Programs

The 1990s saw considerable growth in financial literacy program initiatives from a variety of federal and national organizations. During this period, consumer protection had become a new area of interest for financial literacy program practitioners. In post-Great Recession years 2009 and 2010, two significant pieces of government legislation began shaping and influencing the types of financial literacy programs offered at the time as well. Research continued to be informed by fast-paced developments in financial literacy program practice.

The Credit Card Accountability, Responsibility and Disclosure Act (Credit Card Act of 2009) greatly restricted credit card availability for adults under the age of 21 unless they had adult co-signers or could provide proof they had the financial means to repay debt obligations. Under this legislation, college students were required to obtain permission from parents or guardians to increase credit limits on accounts held jointly with those adults. The new law banned free gift giveaways, popular for drawing in many young students on college campuses. In addition, colleges, universities and alumni associations were now required to disclose the nature of the contracts they sign with credit card marketers allowing access to student and alumni contact information.

The Dodd-Frank Wall Street Reform and Consumer Protection Act (2010) offered protection from unfair or abusive financial practices by lending institutions. Among the act's

provisions was the establishment of the Consumer Financial Protection Bureau, which served as a watchdog of lending practices for financial institutions. For college students, who hold over \$1 trillion in aggregate student loan debt, one particular protection was implemented: a financial aid disclosure form for student loans that was clear, easy to understand, and intended to help consumers with comparative rate searches. The boundaries set by the Credit Card Act of 2009 and the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 were intended to help protect emerging adults whose financial literacy skills, abilities and acumen are still being developed. The Credit Card Act specifically appeared to have a significant impact on reducing college student credit card debt. The number of undergraduate students who reported having a credit card was 30%, which was down from 35% in 2012 and 42% in 2010. (Sallie Mae, 2013).

A few key national programs arose during the 1990s and 2000s. The JumpStart Coalition for Personal Financial Literacy, founded in 1995, had a mission of advancing financial literacy of students during pre-kindergarten through college years. JumpStart was the first organization to publish national standards in K-12 personal financial education (www.jumpstart.org). During the 1990s, NEFE, a previously established non-profit provider of financial planning programs, expanded their mission to strive to empower educated financial decision making for all (www.nefe.org). Toward that end, NEFE began offering programs targeted toward high school students, college students, and for retirement planning. NEFE also began providing general workshop kits to financial literacy program planners. Another program provider, the Federal Deposit Insurance Corporation (FDIC), offered the

Money Smart program dating back to 2001. The FDIC's Money Smart program provided financial training targeted toward helping low- and moderate-income individuals outside the financial mainstream enhance their financial skills and create positive banking relationships (Federal Deposit Insurance Corporation, n.d.). The Financial Industry Regulatory Authority (FINRA), a self-regulatory agency of the U.S. securities industry formed in 2007, offered protection and financial information to investors. In 2009, in consultation with the Department of Treasury, FINRA commissioned the first national study of U.S. adults' financial capability, with a follow up in 2012 (Ketchum, 2013). In 2014, FINRA partnered with the United Way Worldwide to offer grants supporting grassroots financial education programs (FINRA, 2014).

Program proliferation has been a trend in the contemporary context of financial literacy programs. A Fannie Mae-commissioned study found that of ninety programs examined, two thirds began during the 1990s, with three quarters of the programs having been initiated during the short period between the late 1990s up to 2000 (Vitt et al., 2000). As of 2009, there were a reported 56 financial literacy programs sponsored by 20 federal agencies (Hung, Mihaly & Yoong, 2010).

Proliferation of programs, coupled with recent government regulation providing financial protection for the financially at-risk population of college students, has led financial literacy program providers to segment their program offerings, gearing them to specific target audiences. NEFE began offering distinct financial literacy programs targeting high school students and college students, as well as programs focused on retirement planning.

The FDIC's Money Smart programs have been segmented to target youth, adult, and retiree audiences, and one of their programs is specifically geared toward young adults.

Financial literacy programs focused on college students. Within the past 10 to 15 years, there has been an increasing trend in financial literacy programs targeting college students. As emerging adults, traditional aged college students , 18 to 25-year olds (Leskinen & Raijas, 2005) are transitioning from children who depend on parents or guardians to leading independent adult lives. At age eighteen, the students have reached the age of majority in the U.S, at which point they acquire many legal rights as adults.

During their college years emerging young adults are engaged daily in financial activities involving sources and uses of spending, saving and credit. Learning to assume accountability and responsibility for finances and financial activity has become pivotal for young adults seeking to achieve independence. At a critical juncture during the students' growth and development, participation in financial literacy programs can serve to enhance college students' learning and financial acumen (Gutter & Copur, 2011; Xiao, Shim, Barber, & Lyons, 2007). Repercussions – both bad and good – resulting from engaging in financial activities get assimilated into college students' experiential learning (Kolb, 1984). Looking ahead, college students' learning for future relevance is likely to be carried forward into post-college years, when income from full-time employment would provide resources for engaging in longer range financial agreements and investments such as buying a car and/or a home, investing toward their children's future education, and planning and investing for retirement.

Sponsorship and delivery of financial literacy programs for college students.

Historically, parents have been the most significant influence or source of reference for students' financial knowledge and financial behaviors. Cude et al. (2006) reported that 70% of college students indicated their parents were the most significant influence on the students' money management practices. Parents' influence as mentors and role models of financial skills was shown to be strongly related to lower levels of credit card debt among college students (Norvilitis & MacLean, 2010).

The proliferation of financial literacy programs for college students has led to greater variety in sponsorship and types of program offered. Other than parents, the major sponsors of financial literacy programs for college students included educational institutions and non-profit federally funded organizations.

More recently, colleges have begun integrating financial informational sessions into freshmen orientation. As a more traditional method of delivery, a number of colleges and universities have offered an elective credit course in personal finance. Examining the gauge of impact, Peng, Bartholmae, Fox and Cravener (2007) found that participation in a college-level personal finance course was associated with higher levels of investment knowledge. College-sponsored workshops financial literacy programs for college students have yielded success as well. Participation in a 90-minute financial literacy workshop facilitated by upperclassmen peers led to a significant improvement in financial literacy test scores among business major college students (Rosacker, Ragothaman & Gillispie, 2009).

Non-profit federally funded organizations have sponsored the majority of financial literacy programs for college students. Financial responsibility seminars, lasting either 60 or 90 minutes and facilitated by college peer instructors have yielded promising results. An example is seminars sponsored by Students in Free Enterprise, more recently known as Enactus. Enactus is a community of student, academic and business leaders committed to using the power of entrepreneurial action to transform lives and shape a better more sustainable world (enactus.org). Participation in Enactus-sponsored financial responsibility seminars increases college students' financial knowledge and responsible attitudes toward credit, as well as impacting the students' intentions to engage in more responsible financial behaviors in the future (Borden, Lee, Serido & Collins, 2007).

In yet another type of non-profit organization-sponsored educational intervention, colleges and universities have partnered with NEFE, offering a free web-based money management course for college students (<http://www.nefe.org>). In 2008, NEFE partnered with Arizona State University for a multiple-wave study known as Arizona Pathways to Life Success for University Students (APLUS). APLUS is a first-of-its-kind longitudinal study, planned to last at least 10 years. The APLUS study will be surveying groups of young adults as they pass through a series of milestone events: emerging from adolescence and gaining financial independence, joining the workforce, getting married and starting families. One of the objectives in the APLUS study was to investigate the social forces that shape the attitudes and behaviors of today's youth, influencing them in ways that will determine their financial success or failure as adults.

Preliminary results of the APLUS study have been compiled for waves 1, 1.5 and 2. A key finding in the wave 1 survey of college freshmen was the existence of three factors that create an effective solution to avoiding financial problems when students start college (Shim, Serido, & Xiao, 2009). Parental involvement had the greatest influence, formal financial education in high school had the next highest influence, and work experience in the form of a part-time job had the third highest influence. Also, 73% of students were found to have participated in a risky financial behavior in the previous six months.

Key findings in wave 1.5, conducted to assess the impact of the national economic crisis of 2008 on the cohort, were: 95% of families were impacted by the national economic crisis, the students experienced their highest increases in credit card debt and had fewer responsible savings behaviors, and the economic downturn greater affected females financially and affected males more academically (Shim & Serido, 2010). Key findings in wave 2 conducted on the cohort four years after they entered the university reveal what the researchers describe as a "snowball effect" (Shim & Serido, 2011). The snowball effect showed early efforts of financial education in high school and again in college exponentially increased the likelihood that students would pursue additional financial education as time goes on, such as informal learning through books, magazines and seminars.

Summary of Programs in Financial Literacy for College Students. Financial literacy programs have been identified as a means of investment in human capital in the U.S. (Lusardi & Mitchell, 2013). Financial literacy programs for college students could be influential in impacting college students' financial capability at a critical point during their

life cycle development. Programs for the financial literacy of college students have experienced fast-paced growth over the last decade. With encouraging results, evidence-based data regarding successful delivery of financial literacy programs for college students has been informing theory and research.

Chapter Summary

The current study's unique conceptual framework incorporated Self-Efficacy Theory as a manner of inquiry into whether college students' beliefs in their financial abilities were associated with their motivation, financial behavioral choices, perceived confidence level toward functioning well in their financial behaviors, and resilience to adversity when presented with unfamiliar or difficult challenges.

Four models of financial literacy/financial capability provided influence by further supporting the current study's conceptualization of financial literacy. The four models included: the Hung, Parker and Yoong Conceptual Model of Financial Literacy (2007), the Leskinen and Raajas Life Cycle Approach to Consumer Financial Capability (2005), the McQuaid and Egdell Model of Financial Capability (2010), and the Huhmann and McQuitty Conceptual Model of Financial Numeracy (2009). Acknowledging common themes in conceptual models, the current study isolated the role of financial behaviors and behavioral influences with a unique conceptualization of the financial literacy of college students based in Self-Efficacy Theory.

In the current study's research review, 12 selected studies in the financial literacy of college students were critiqued to highlight current understandings of the financial literacy of

college students. Two key areas of concern in financial literacy research of college students were identified: variation in financial literacy definitions and variation in tests of financial literacy.

In the historical context, financial literacy programs were of an applied and pragmatic nature, thus reactive in design. Historical financial literacy program practice took a larger role in informing research. In the contemporary context of financial literacy programs, scholarly studies have evolved to a point where researchers have been establishing a unique body of knowledge, theory and evidence delineating the foundation of the phenomenon of financial literacy.

CHAPTER 3

Methodology

The purpose of the current study was to evaluate whether college students' financial behaviors and self-efficacy could be used to predict their financial literacy levels. Financial behaviors were evaluated across Lusardi's (2009) typology of four classes of financial transactions: (1) use of traditional sources for borrowing excluding credit cards; (2) use of alternative sources for borrowing; (3) methods of saving, investing and paying; and (4) credit card use. Self-efficacy as a behavioral influence was evaluated using two types of self-perceived financial ability measures, motivation and self-confidence. Lastly, demographic attributes were examined for purposes of describing characteristics of the undergraduate college students who participated in the current study.

The methodology chapter begins with a description of the research site and sample. Research questions and variables used in response to the research questions are discussed. Next, an instrumentation section provides details about the survey instrument used, the pilot study background, and financial literacy test item analysis. Measures of reliability and validity are then detailed. Background information regarding data collection and confidentiality are provided. The data analysis section addresses the statistical tests that were used to answer the current study's research questions and provides an illustration of the measurement model. Finally, delimitations bounding the study's design along with limitations due to restrictions not under the control of the researcher are considered.

Research Site and Sample

The current study had a unique context as part of a broader multi-university study, Online Investor Education for College Students, based out of the University of Tennessee-Knoxville (Morrow & Wise, 2010). The University of Tennessee-Knoxville (UTK) study was conducted at five land-grant institutions in TN, FL, KY, KS and MS, with a control group at North Carolina State University (NCSU). The purpose of the UTK study was to evaluate the impact of an educational intervention, in the form of web-based investor education training modules, developed specifically for college students. Both pre- and post-test surveys were administered to the participants at the five land-grant universities. The participants from NCSU were not exposed to the UTK's study educational intervention, completing only the post-test survey as part of the control group.

As a subset of the UTK study, the NCSU control group component on which this study was based had two purposes: (1) to act as a control group for the five-institution study assessing financial management and investment acumen among undergraduate college students at a land-grant university who were not exposed to the educational intervention, and (2) to ascertain the students' prior exposure to financial and investment management behaviors, as well as to consider the relationship of the students' confidence and motivation as measures of their self-efficacy had in association with their financial literacy levels.

Population and Sample

The population for the study included 25,246 undergraduate students based on enrollment statistics from North Carolina State University for fall semester of 2010 (North

Carolina State University, 2010). NCSU is a research-extensive land-grant university. The university has a focus on science, technology, engineering and math degree tracks that emphasize innovation and on-the-job experience. NCSU has been cited as the fourth best value among public U.S. universities (Princeton Review, 2014).

The population as a whole was comprised of predominantly white, full-time, male students from within the state of North Carolina. The fall 2010 enrollment statistics appeared to align with both NCSU's mission and ranking as a top choice public university. Detailed percentages by student characteristic can be found in Table 3.1.

Table 3.1. NC State Student Enrollment as a Percentage of the Undergraduate Population, Fall 2010

Characteristic	Gender	Residence	Full/Part Time Status	Ethnicity
Female	43.7			
Male	56.3			
In-State		90.1		
Out-of-State		8.3		
International		1.6		
Full-Time			87.7	
Part-Time			12.3	
White				76.1
Black/African American				8.2
Asian American				5.3
Hispanic				3.3
Other/Unknown				5.8
Two or more				1.3

Note: Adapted from: "NC State Enrollment Report Summary Tables – Fall 2010", Retrieved from: <http://www2.acs.ncsu.edu/UPA/archives/enrollmentdata/f10enrol>. Copyright 2010 by North Carolina State University.
n = 25,246.

The sampling frame was taken by the Institutional Research Department at NCSU. For the sampling frame, approximately 2000 students from the fall 2010 undergraduate population were targeted for selection via simple random sampling technique. The procedure for creating the sampling frame involved use of the SAS RANUNI function to assign each student in the population a unique random number. The resulting dataset was sorted by random number, and the first 2000 student email addresses were used to create the sampling frame. The students in the sampling frame were contacted via email in batches of 500 students at time. However, the UTK researchers were not able to send out all 2000 emails due to exam deadlines and the Thanksgiving holiday. Of the 285 students who chose to participate in the survey, approximately 141 did not fully complete the entire 101-item survey, resulting in a final sample size of $n=144$ undergraduate students.

Research Design

The cross-sectional, predictive study (Johnson 2001) was non-experimental in design. For its time dimension, the data for the study were collected at a single point in time, using a self-reporting web-based survey questionnaire instrument. For its research objective dimension, the current study used a multiple regression equation for purposes of modeling the predictive variables associated with the financial literacy of undergraduate college students.

Research Questions

The current study addressed three research questions exploring predictors of the financial literacy of college students:

1. Does college students' self-efficacy predict their financial literacy?
2. Which financial behaviors predict the financial literacy of college students?
3. Among college students, which demographic characteristics describe who is more financially literate?

Variables used in the Predictive Models

Three distinct predictive models were created for the current study. All three predictive models used the same dependent variable, financial literacy test score which was represented by the total number of correct responses on a 17-item financial literacy test. The selection process for the independent variables differed for models one and two based on the premise under which each predictive model was created. For model one, the selection of independent variables was based on insights derived from existing research in the financial literacy of college students. For model two, the independent variables were selected based on the current study's exploration grounded in Self-Efficacy Theory, a framework which has yet to be used to study college students' financial literacy. Selection of predictors for model three included only the independent variables having statistical significance resulting from the creation of model two. As a refinement of model two, model three was built in a hierarchical manner corresponding to each of the study's three research questions. In model three, the independent variables relating to each research question were organized and entered into the model in three distinct blocks relating to undergraduate college student demographics, self-efficacy, and financial behaviors. The addition of each block of

independent variables emphasized the contribution each block had on model three's total effect size during its first-pass, second-pass and third-pass runs.

Dependent Variable

Ability tests have a long and established record of use in predicting student performance (Gregory, 2011). The dependent variable for the current study's predictive models was the financial literacy test score, which provided a measure of the undergraduate college students' financial knowledge, skills and abilities.

Predictor Variables

In multiple regression models, the independent variables are also known as predictors. The three areas of inquiry represented by the research questions included self-efficacy, financial behaviors and student demographics. This study's comprehensive survey instrument contained 33, 16 and 9 items respectively associated with the three areas of inquiry, resulting in a total 58 items available to be used as potential predictors. An often cited rule of thumb for the lower end ratio of observations to predictors in multiple regression modeling is 10:1. Had all 58 predictors had been used in the regression model, the ratio would have been 2:1, which is well below the more desirable 10:1 ratio of observations to predictors. Specific procedures used for limiting the predictor variables are detailed in the next sections.

Model One Predictors. The goal for predictive model one was to maintain a ratio of 10:1 observations to predictors. Toward that end, the possible list of predictors for the sample size of 144 needed to be cut significantly by 41 items, from 58 down to 15 predictors.

Among the 33 potential self-efficacy predictors in model one, a total of 8 were retained. Since the NCSU control group study participants were not exposed to the investor education training modules, 13 self-confidence and motivation predictors relating to the content of the investor education modules were omitted as predictors. Another 12 predictors associated with planning and future-oriented behaviors were omitted as well (see Appendix E, Frequency Distributions Financial Behavior Variables). The 12 additional omitted predictors captured both self-confidence and motivation toward: saving for the future, increasing savings, determining how much to spend based on income, saving for an emergency, repaying debt, and planning for future savings.

Leveraging insights from research in the financial literacy of college students, the eight self-efficacy predictors retained in model one were chosen based on predictors which had greater relevance in the near term to the undergraduate college students' most common financial activities, and/or tended to be more generalized. The self-efficacy predictors retained in model one included four predictors of self-confidence toward managing finances, reducing spending, using credit cards less often, and controlling debt. Four additional predictors of motivation toward managing finances, reducing spending, using credit cards less often, and controlling debt were retained in model one as well.

In model one, the number of financial behavior predictors was cut from 16 down to four. Decisions for culling financial behavior predictors were made with a premise of retaining only the most prevalent financial behaviors among undergraduate college students across four categories of financial transactions: use of traditional borrowing sources, use of

alternative borrowing sources, saving, and investing. Selection of the most prevalent financial behavior was based on highest frequency of each behavior indicated by the undergraduate students in the sample. Use of traditional sources for borrowing was measured using a single predictor, student loan borrowing. Behaviors associated with alternative sources for borrowing was measured with one predictor, use of a pawn shop. Last, the predictor used for depicting savings activities was opening a savings account or buying a Certificate of Deposit, while the predictor retained for investing activities was investing in bonds inclusive of savings bonds.

Finally, the number of demographic predictors used in model one was reduced from nine down to three. Precedence exists for using college students' demographic attributes as predictors of their financial literacy. A regression model of the predictors of financial literacy of Australian university students (Beal & Delpachitra, 2003) found two statistically significant predictors associated with college students' higher financial literary test scores, male gender, and higher income levels. A second study's regression model of the predictors of financial literacy among first generation female college students (Eitel & Martin, 2009) revealed the variables of greater age, Caucasian ethnicity and higher class rank were associated with higher college student financial literary test scores. With insight from research, the three demographic predictors retained for model one included: (1) age coded as a continuous variable, (2) gender coded as 1= female and 0 = male, and (3), business as a primary major in college coded as 1 = business major, 0 = all other college majors.

In the end, a total of 15 of 58 potential predictors were retained for model one: eight

self-efficacy predictors, four financial behavior predictors and three demographic predictors. With a sample size of 144, the ratio of observations to predictors for model one was approximately 10:1.

Model Two Predictors. Informed by Self-Efficacy Theory grounding the current study's exploration, the number of predictors retained for model two was not as severely restricted as in model one. The looser restriction was due to both the explorative nature of this study as well as the large number of potential predictors available. The threshold for model two was to maintain a ratio of at least 5:1 observations to predictors. Toward that end, the possible list of predictors for the sample size of 144 needed be cut in half, from 58 down to 29 predictors.

Among the potential 33 self-efficacy predictors, the 16 predictors of motivation and 17 predictors of self-confidence matched nearly one to one for characteristics being measured, with the exception of one extra self-confidence item associated with recognizing investment schemes. For the 33 self-efficacy predictors, an analysis of means was performed to learn whether the strongest and weakest predictors were the same among comparable survey items capturing self-confidence and motivation. In contrast to selection of predictors based on existing research used for model one, bivariate correlations See appendix E, Intercorrelations- Motivation and Intercorrelations Self Confidence. were then used for making decisions regarding which predictors were kept versus which were discarded for model two Since developing the list of predictors used in model two involved performing

statistical procedures and analysis, the final list of predictors retained in model two can be found in chapter four findings, the predictive models section.

Instrumentation

Survey Instrument

The current study's survey instrument represented a modified version of the UTK study survey questionnaire. The UTK survey instrument was modified by removing items pertaining to the investor education training modules in which the NCSU control group respondents did not participate. The modifications also included the addition of an 11-item personal financial wellness scale and an additional 17 items regarding financial behaviors across a typology of four classes of financial transactions.

Including the initial three items used to capture informed consent, the survey contained 101 items (see Appendix B, Investor Education for College Students – Control Group Posttest Survey Instrument). There were 33 items regarding self-confidence in or motivation toward specific financial behaviors. A 17-item multiple choice financial literacy test followed. Next were 17 items regarding financial behaviors across a typology of four classes of financial transactions (Lusardi, 2009).

Continuing with the survey content, one item asked for the number of credit cards held in the student's own name. Two items inquired whether the student had taken a financial education class in either high school or college. One item asked who prepared the students' income taxes, while another asked about the students' comfort level with their current income status. Four items captured the students' preferences for obtaining financial

information, encompassing both who provided the information and how it was provided. One item inquired about the impact of past positive financial experiences. The survey questionnaire also included an 11-item Personal Financial Wellness Scale. The last 10 items captured student demographic information.

Pilot Study Background. The 17 items comprising the test of financial literacy on this study's survey questionnaire were developed as the result of a UTK pilot study. The objective of the pilot study was to assess college student needs in the area of investor education. The students' assessed needs were then used as a basis for creating a training course in investor education specifically targeted toward college students. Creation of the course was sponsored by the Financial Industry Regulatory Authority (FINRA), and developed in conjunction with scholars at the UTK. FINRA also sponsored the UTK study.

Financial Literacy Test Item Analysis. An evaluation of the construction of the current study's financial literacy test was conducted using item analysis. Item analysis in test construction was used to assess the effectiveness of test items (Gregory, 2011). Analysis of two separate indices was conducted on the test items, an item discrimination index and an item difficulty index.

The item discrimination index was used to help determine how efficiently a particular test item discriminated between persons who obtain high and low scores on the entire test. Item discrimination was calculated using the formula $d = (U - L) / N$ where "d" denoted the item discrimination index, "U" denoted the number of correct responses in the upper 25% of all sample respondents, "L" denoted the number of correct responses in the lower 25% of all

sample respondents, and “N” denoted the total sample size. Values can range from -1.0 to +1.0. A positive value for item discrimination index is preferred (Gregory, 2011).

A second index, item difficulty, was used to determine the proportion of examinees who respond correctly to a particular test item. Item difficulty index was calculated by dividing the number of correct responses to a test item by the sample size. The resulting item difficulty index lies on a scale of zero to one. Optimal item difficulty should fall in the range of 0.2 to 0.7 (Gregory, 2011).

Reliability and Validity

The potential for error exists for any data set collected for research (Litwin, 1995). Toward a goal of providing more accurate data, reliability and validity coefficients of the financial literacy test used in the current study were calculated to identify and quantify the potential for error during the data collection process for the current study.

Reliability

Reliability is an important measure of the internal consistency of test items (Gregory, 2011, Ravid, 2011). The Intraclass Correlation (ICC) coefficient was selected for the reliability measurement of the current study’s financial literacy test items. Rationale for using the ICC coefficient was twofold. The ICC coefficient was used to find errors in the measurement system, and has been cited as suitable for use when there are many raters such as a number of students’ responses to exam items (Griffin, 2013). To compute the ICC statistic, each of this study’s 17 financial literacy test items was coded as a dichotomous variable. A value of one was assigned correct responses and a value of zero to incorrect

responses. Reliability of the 17 items comprising the study's financial literacy test was analyzed using the SAS JMP procedure for intraclass correlation . Specifically, the Measurement and Systems Analysis procedure within JMP's Quality and Process Analysis tools was run to find ICC coefficient. The resulting ICC coefficient was used for determining how well the measurement system performed based on how much variation was found in the measures.

Validity

In empirical research, validity has traditionally been measured using a variety of techniques. For the current study, measures of validity included face validity, content validity and predictive validity.

Face validity. Face validity of the original UTK survey questionnaire, on which the current study's survey questionnaire was based, had been established by the scholars at UTK during their pilot study. Face validity of the survey's 17 items on the test of financial literacy had been further substantiated by FINRA who sponsored the UTK study.

Content validity. A content validity coefficient of inter-rater consensus by a panel of expert judges was established to help assess relevance of the 17 test items measuring the construct of financial literacy. The expert judges were scholar-practitioners in the area of financial literacy from various universities who volunteered to serve as judges. A rating form inclusive of instructions for rating the items on the current study's 17-item financial literacy test was sent to the volunteer judges by email. The judges email responses were collected and summarized using Microsoft Excel. A sample of the judges rating form can be found in

Appendix C, Figure C3. The validity coefficient was based on input from the panel of five expert judges. The judges completed a survey using a four-point Likert scale as an evaluation of content validity of the each of the current study's 17 financial literacy test items. Values for the four-point scale were: 1 = very relevant, 2 = somewhat relevant, 3 = quite relevant, 4 = very relevant. A content validity coefficient was calculated based on the formula represented in Figure 3.1.

Figure 3.1. Content Validity Calculation of Financial Literacy Test Items based on Inter-rater Consensus of Five Expert Judges

$$\text{Content validity} = D / (A + B + C + D)$$

Figure 3.1. Content Validity Calculation. Note. Judges rated each of the 17 financial literacy test items on a 4-point scale where 1 = not relevant, 2 = somewhat relevant, 3 = quite relevant and 4 = very relevant. In the equation, D represents the total number test items receiving a judge's rating of 4; A represents the total number test items receiving a rating of 1; B represents the total number test items receiving a rating of 2; C represents the total number test items receiving a rating of 3. Adapted from *Psychological Testing History, Principles, and Applications (6th ed.)* (p. 112), by R.J. Gregory, 2011, Boston, MA: Allyn & Bacon. Copyright 2011 by Pearson Education, Inc.

In the formula, "D" represents the total number test items receiving a judge's rating of 4; "A" represents the total number test items receiving a rating of 1; "B" represents the total number test items receiving a rating of 2; and, "C" represents the total number test items receiving a rating of 3. The resulting validity coefficient value fell between zero and one. Stronger correlation was indicated by higher values of the coefficient of validity.

Predictive Validity. Predictive validity has been described as a concurrent validity measure typically desirable for achievement tests (Gregory, 2011). It is a criterion-related validity which used test scores to estimate who is likely to succeed at a future endeavor.

More widely known examples have included the use of entrance exam test scores to predict students' grades in college or pre-employment exams to predict employee job performance ability. For the current study, predictive validity was established using multiple regression equations which described the best-fitting straight line for selected criterion associated with undergraduate college students' financial literacy test scores. As a determinant of predictive validity, the resulting R-squared values from the multiple regression equations were used to measure effect size.

Data Collection and Confidentiality

The study used data collected from the UTK's NCSU control group study titled Online Investor Education for College Students – Control Group Study (Bird, 2010). Data were collected during the fall semester of 2010. Each survey respondent provided informed consent (see Appendix C, IRB Consent Form). For the current study, an IRB request for exemption for research involving the use of secondary data was approved by NCSU (see Appendix D, IRB Request for Exemption Approval).

For data collection, a list containing 2000 randomly selected NCSU undergraduate students' email addresses was forwarded by the NCSU researchers to the UTK research team. In batches of 500 students at time, the UTK research team contacted the students via an email inviting the students to participate in the study. Students chose to participate in the study by clicking on a link to the web-based survey questionnaire embedded within their email invitations. Responses were collected over a ten day period. An incentive, an Amazon Kindle electronic reader was offered and rewarded to one randomly drawn survey participant

who completed the survey and provided contact information. The UTK research team captured the respondents' confidential responses from the web-based survey in a data file. The UTK team coded the responses and forwarded both a data file and survey codebook to the researchers at NCSU. The data file in the file were anonymous, meaning there was no link, either direct or through identifiers, which could be used to trace the identity of the survey respondents.

Data Analysis

SAS JMP computer software was used to perform data analysis. For quantitative evaluation of the research questions, the study used a variety of statistical techniques to examine the predictors of undergraduate college students' financial literacy: univariate examination, bivariate correlation and multiple regression modeling.

For univariate examination, descriptive statistics including frequencies, means and standard deviations were used to describe the sample. Responses to survey items used as either dependent or independent variables in the predictive model were reviewed to isolate responses that were left blank, were unreasonable or did not make logical sense, or were miscoded. For example, for gender, a single respondent selected the answer choice, "prefer not to respond." Since gender was used as one of the predictors in the multiple regression models, this observation was dropped. Scatterplots were used to help find outliers as a way of identifying extreme observations that could have an impact on the predictive equation. An outlier found among either the dependent variable, financial literacy test score, or any of the 17 predictor variables used in the multiple regression equation was likely used to disqualify

the observation from the sample.

Bivariate correlations were run to determine if there was any overlap among the predictor variables in the multiple regression equation. High correlation among predictor variables resulted in one or more of the variables contributing to a multicollinearity condition being removed from the regression model.

Predictive Models

Because the study was exploratory in nature, the forward step-wise multiple regression model selection procedure was chosen. In the forward step-wise procedure, with the addition of each new predictor variable, existing variables which lost their significance were dropped from the model.

Three distinct predictive models were created using SAS JMP's Fit Model Stepwise procedure with a forward directional designation. Model one included 15 predictors for the financial literacy of undergraduate college students. Selection of its predictors was based on what is known from existing research. Model two used as many as 29 predictors of financial literacy. Selection of predictors for model two was unique to the current study's framework grounded in Self-Efficacy Theory. For models one and two, all predictors were entered at the beginning of the multiple regression procedure. The stopping rule was based on p-value threshold of having a probability of less than or equal to .25 to enter the model, with a probability of less than or equal to .10 to leave the model.

Model three represented a refined version of model two's results. The predictors used for model three included only those which had statistical significance in model two. Model

three was created using a hierarchical approach to emphasize the impact that each block of predictors had on the model's effect size. Rather than all of the predictors having been entered at the beginning of the multiple regression procedure as in model two, model three's predictors were instead entered in additive blocks. For the first block, all of the demographic predictors were entered at the beginning of the multiple regression procedure and an R-squared statistic representing the effect size of just the demographic block of predictors was obtained. In the second block, all of the demographic predictors plus all of the self-efficacy predictors were entered at the beginning of the multiple regression procedure, and a second R-squared statistic representing the two blocks of predictors was obtained. For the third and final block, all three blocks of predictors, demographics, self-efficacy, and financial behaviors, were entered at the beginning of the multiple regression procedure. A third and final R-squared statistic was obtained representing all the effect size of all three blocks of predictors in hierarchical multiple regression model.

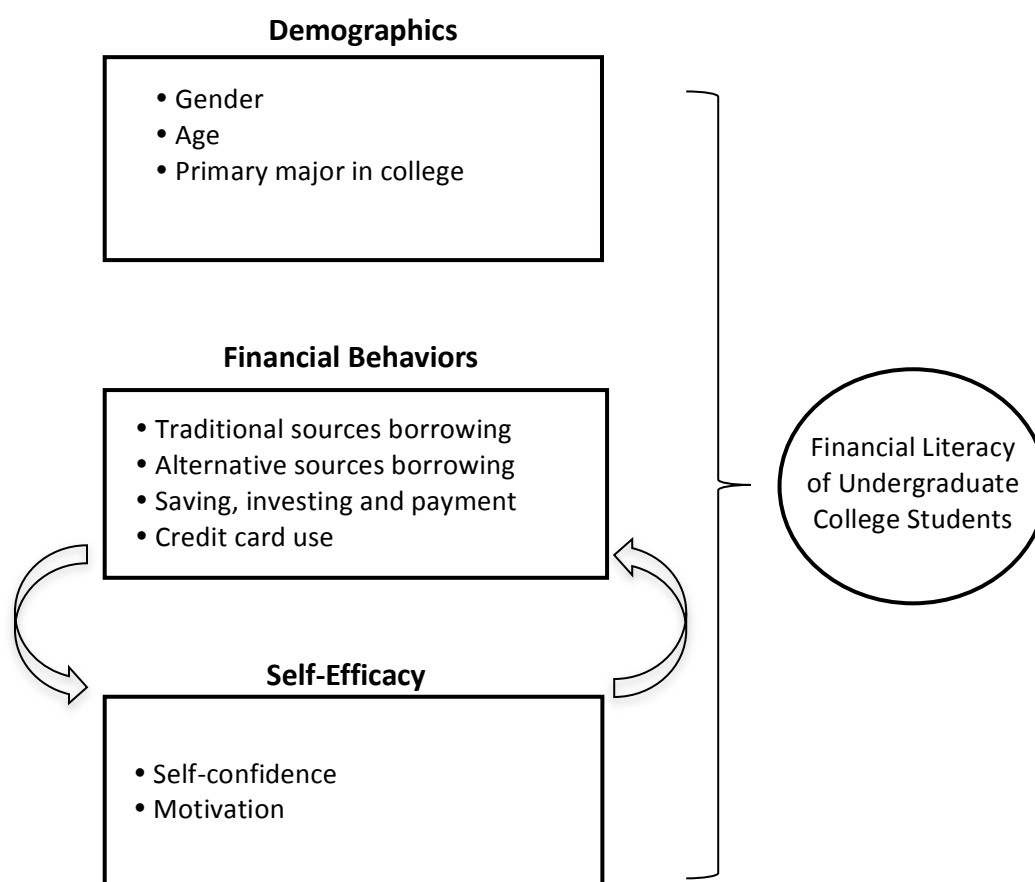
The multiple regression model assumes linearity, constant variance, normality in the distribution of y-values for a specific x-value, and independence between x-values and the y-value predictors. To assure these assumptions were met, some reasonableness checks were run. A frequency distribution was run to verify normality of the distribution of predictors for financial literacy test score. Scatterplots of residuals were run to detect lack of fit or unequal variances indicating homoscedasticity or non-linear relationships.

Measurement Model

The study used multiple regression models to predict the financial literacy of

undergraduate college students. Based on the study's research questions, the predictor variables addressed three areas of inquiry exploring undergraduate college students' financial literacy: demographics, financial behaviors and self-efficacy. Figure 3.2 illustrates the relationship between the predictor variables, student demographics, financial behaviors and self-efficacy, and the dependent variable, the financial literacy of undergraduate college students.

Figure 3.2. Measurement Model of the Predictors of Financial Literacy of Undergraduate College Students



Limitations/Delimitations

The current study's predictive model was based on self-reported, self-perceived data.

Self-reported data have been cited as being susceptible to social desirability bias (Arnold & Feldman, 1981). Social desirability bias refers to the tendency of research subjects to give socially desirable responses instead of choosing responses that reflect their true feelings or behaviors. Another limitation was related to data collection. The data had been collected over a relatively brief 10-day period, so as not to infringe on student preparation time during the weeks leading up to final exams.

Ethnicity/race was not included as a demographic variable in the measurement model. The exclusion was based on how ethnicity was captured on the survey questionnaire. The primary survey item capturing ethnicity allowed for multiple ethnicities to be specified. Obtaining a clear picture of student ethnicity was further complicated by an additional survey item that captured responses to the question, “Are you Hispanic?” Responses to this additional survey item were coded as dichotomous yes/no value.

Income or some measure of socio-economic status has been cited for its association with financial literacy of college students (Beal & Delpachitra, 2003; Mandell, 2009). The current study’s survey instrument did not contain a measure of either students’ or parents’ income.

Inherent in the design of the multiple regression model was the premise that the model should be used for predictions indicating association only, not to show cause and effect (Agresti & Finlay, 2009). Lastly, the direction of prediction in the current study’s multiple regression model was not explicit, meaning measures of self-efficacy and financial behaviors could predict undergraduate college students’ financial literacy, or conversely,

financial literacy could predict the students' self-efficacy and financial behaviors.

CHAPTER 4

Findings

The purpose of the current study was to evaluate whether college students' financial behaviors and self-efficacy could be used to predict their financial literacy levels. Financial behaviors were evaluated across Lusardi's (2009) typology of four classes of financial transactions: (1) use of traditional sources for borrowing excluding credit cards, (2) use of alternative sources for borrowing, (3) methods of saving, investing and paying, and (4) credit card use. Self-efficacy as a behavioral influence was evaluated using two types of self-perceived financial ability measures: motivation and self-confidence. Lastly, demographic attributes were examined for purposes of describing characteristics of the undergraduate college students who participated in the current study.

This study addressed three research questions in its exploration of the predictors of the financial literacy of undergraduate college students:

1. Does college students' self-efficacy predict their financial literacy?
2. Which financial behaviors predict the financial literacy of college students?
3. Among college students, which demographic characteristics describe who is more financially literate?

The findings chapter begins with descriptive statistics based on frequency distributions and analyses of central tendency for three categories of independent variables: self-confidence, motivation and financial behaviors of undergraduate college students. A summary of the students' average financial literacy test scores, the dependent variable, was

included as well. An evaluation of the current study's financial literacy test instrument is presented inclusive of the results indicating its reliability and validity. The chapter concludes with predictive model findings obtained from the multiple regression statistical modeling results.

Descriptive Statistics

Across the entire sample the undergraduate college students' ages ranged from 18 to 40, having a mean age $M=20.7$, $SD=3.0$, with traditional aged college students, 18 to 25 year-olds, representing a predominant proportion, 93.3% of the study's participants. In contrast to the study's population of undergraduate students at NCSU, female participants in the sample were more highly represented at 61.8% proportionately. This finding is consistent with research indicating that in college student populations, females were more likely than males to respond to surveys (Porter & Whitcomb, 2005). Differences existed between reported ethnicity for the population and that of the sample as well. A comparison of population and sample demographics can be found in Table 4.1, Undergraduate College Student Demographics: Comparison of Population and Sample. In the sample, White/Caucasian ethnicity was nearly 6% higher than the study's population, of which the proportion of Whites/Caucasians was 76.1%. Greater participation by Whites/Caucasians in the sample was consistent with Porter and Whitcomb's (2005) finding that among college student populations, white students were more likely than those of minority ethnicity to respond to surveys. Across all minorities, participation was lower in the sample versus the population with one exception.

Table 4.1. Undergraduate College Student Demographics: Comparison of Population and Sample

Demographic		Population n=25,246	Sample n=150
Gender			
	Female	43.7%	61.8%
	Male	56.3%	38.2%
Ethnicity			
	White/Caucasian	76.1%	81.9%
	Black/African American	8.2%	2.8%
	Other/Unknown	5.8%	1.4%
	Asian American	5.3%	4.2%
	Hispanic	3.3%	1.4%
	Two or more	1.3%	8.3%

Note. Population and sample demographic percentages are based on fall 2010 enrollment.

The proportion of students reporting two or more ethnicities was more than six times higher among the sample's participants where 8.3% reported multiple ethnicities versus students in the general population. The higher percentage of multiple ethnicity students in the sample was most likely related to how ethnicity was captured on the survey questionnaire. For one of the survey items, item 92, multiple ethnicities could be checked and included a response for "other" ethnicity which could be checked with space provided for a write-in value. However, Hispanic was not included as a response choice for item 92. A subsequent survey item, item 93, captured responses to the question, "Are you Hispanic?" While responding to item 92, students may not have read ahead to the subsequent item 93 used to capture Hispanic ethnicity. A total of five students in the sample selected the response choice

Caucasian for item 92 and additionally reported “yes” for item 93 indicating Hispanic ethnicity, potentially contributing to the multiple ethnicity student count.

Undergraduate College Students’ Self-Efficacy and Financial Behaviors

Looking beyond student demographics, measures of central tendency were run to gain insight into other areas of inquiry for the predictor variables used for the study’s multiple regression models: self-efficacy and financial behaviors. Both similarities and differences were found among the mean ratings of self-efficacy items used to capture the students’ self-confidence and motivation for a number of specific financial skills and abilities. The survey instrument contained 17 items related to undergraduate college students’ self-confidence in specific financial abilities. An analysis of means was conducted for the students’ self-confidence ratings for the items which were captured via 5-point Likert scale with values ranging from 1= strongly disagree to 5 = strongly agree. The students’ mean self-confidence ratings are summarized in Appendix D, Table D1, Self-Confidence Ratings of Undergraduate College Student Financial Abilities.

Students’ ratings indicated they had highest levels of self-confidence toward using credit cards less often ($M=4.21$, $SD=0.85$) and making a plan for future savings ($M=4.11$, $SD=0.72$). Conversely, the students had the lowest self-confidence in understanding how to invest in the stock market ($M=2.42$, $SD=1.20$) and recognizing an investment scheme ($M=3.05$, $SD=1.08$).

The survey instrument contained an additional 16 items related to undergraduate college students’ motivation toward specific financial skills and abilities, ranked using the

same 5-point Likert scale responses as were the self-confidence items. The students' mean motivation ratings are summarized in Appendix D, Table D2, Undergraduate College Students' Motivation Ratings toward their Financial Abilities. Similar to results on the self-confidence ratings, the students ranked understanding how to invest in the stock market ($M=3.76$, $SD=1.12$) as an area of lowest motivation. Compared to the top two areas of highest self confidence ratings, a difference was found in one of the top two motivation ratings, controlling debt ($M=4.31$, $SD=0.80$), while the other highest ranked motivation item, saving for the future ($M=4.31$, $SD=0.85$) was similar to one of the top two self-confidence items, making a plan for future savings. The most significant difference between self-confidence and motivation rankings was found in the undergraduate college students attitudes toward using credit cards less often, which had one of the lowest motivation rankings ($M=3.87$, $SD=1.05$) while conversely having the highest self-confidence ranking.

For the predictors of financial behaviors, which were measured using dichotomous yes/no variables, frequency distributions were run to identify more common undergraduate college student financial behaviors across Lusardi's (2009) four classes of financial transactions. For traditional borrowing sources, student loans (58%) and automobile loans (12%) were the most frequently used methods. None of the traditional-aged college students in the sample held home mortgages: only 5 students, all over the age of 26, indicated having home mortgages. For alternative borrowing sources, the most frequently used methods were pawn shops used by 11% of students, layaway for purchase of goods used by 10%, and pay day advance loans used by 6% of students. Very large proportions of the students had

opened checking accounts, 97%, or savings accounts, 90%. For investing activities, over one third (34%) of the students had made investments using one or more of three methods: bonds, mutual funds or stocks. Of the three investment types, more students reported investing in bonds inclusive of savings bonds (22%), than mutual funds (17%) or stocks (16%).

Reductions in the number of credit cards obtained under the student's names as well as the amount of credit card debt carried by college students have been attributed to restrictions from The Credit Card Act of 2009 in conjunction with economic pressures resulting from the great recession of 2008 (Eferighe, 2013). These trends can be seen in the current study's sample where a little more than half of the undergraduate students, 55%, reported having zero credit cards in their own name, while another 28% held only one credit card in their own name.

Undergraduate College Students' Personal Financial Wellness

As evidenced by aggregate school loan debt in excess of \$1 trillion, college students are a financially at risk population (Brown, Haughwout, Mabus, & Van der Klaauw, 2012). Over half the students in the sample, 57.6%, reported holding student loans. The percentage of students in the current study with student loan debt was a few percentage points above the national average. During 2011-2012 for students attending public four-year institutions, the percentage of undergraduate college students who financed their education with student loans nationally was 50% (National Center of Education Statistics, 2013). A stronger sense of financial well-being has been cited for its association with college students' overall psychological well-being and ability to persist (Xiao, Tang & Shim, 2008). An eight-item

scale, known as the Personal Financial Wellness (PFW) Scale, was incorporated into the current study's survey questionnaire. The PFW scale was used for characterizing (1) perceptions about the participants' financial well-being, and (2) stress level associated with their present financial condition. The eight-item PFW Scale can be found in Appendix D, Figure D1. Financial well-being of this study's undergraduate college student participants was determined based on average PFW score. The PFW scale included four items corresponding to the student's state of financial well being at the time of the survey, and four items describing how that student felt about his or her state of financial well-being at the time of the survey. For each participant, responses for the eight items in the PFW scale were summed and a mean score was calculated. Higher mean PFW scores have been associated with male college students, indicating males had less discomfort with their overall financial status and also in attitudes about their financial well-being than did their female counterparts (Prawitz et al., 2006). The current study's results followed this trend, with mean scores for males $M=6.4$ and females $M=5.5$. Further, the mean of the overall undergraduate college students in the sample ($M=5.8$) tracked closely with the mean score of adults in the general population ($M=5.7$). A summary of the PFW scores for this study's sample is depicted in Table 4.2, Personal Financial Wellness Scores of Undergraduate College Students.

Table 4.2. Undergraduate College Students' Personal Financial Wellness Scores

	n	Mean	SD	SE	95% CI
Total Sample	144	5.8	2.2	0.18	[5.5, 6.2]
Females	89	5.5	2.1	0.22	[5.0, 5.9]
Males	55	6.4	2.2	0.30	[5.8, 7.0]

PFW mean scores by gender were aligned within one-tenth of one point for undergraduate college students in the sample versus adults in the general population, where for adults in the general populations the mean score for males was $M=6.2$ and for females was $M=5.4$ (Prawitz et al., 2006). Based on normative descriptive terminology used for interpreting PFW scores, this study's average scores for females fell in the range between 5.0, described as average financial distress/average well-being, and 6.0 described as moderate financial distress/moderate financial well-being. The current study's average scores for males fell in between the aforementioned range of 6.0 described as moderate financial distress/moderate financial well-being and 7.0, described as low financial distress/good financial well being. The entire range of normative descriptive terminology for interpreting PFW scores can be found in Appendix D, Figure D2.

Undergraduate College Students' Financial Literacy

College students have been known to exhibit low scores on tests of financial literacy, with average scores of correct responses ranging from 30-62% (Avard, Manton, English & Walker, 2005; Chen & Volpe, 1998; Mandell, 2009; Murphy, 2005; Norvilitis, Merwin, Osberg, Roehling, Young & Kamas, 2006). The mean financial literacy test score for the overall sample was $M=9.8$ ($SD=2.5$), corresponding to a 58% correct response rate on the 17-item financial literacy test. Based on frequently used 7-point or 10-point college student grading scales, the 58% score would reflect insufficient comprehension of the concepts being tested. Mean financial literacy test scores were analyzed for the three categories of

demographic variables used in the current study's predictive model. Results are summarized in Table 4.3, Financial Literacy Test Scores of Undergraduate College Students.

Table 4.3. Financial Literacy Test Scores of Undergraduate College Students

		n	Mean	SD	SE	95% CI
Total Sample		144	9.8	2.5	0.21	[9.4, 10.2]
Gender	Females	89	9.5	2.5	0.27	[9.0, 10.0]
	Males	55	10.3	2.5	0.34	[9.7, 11.0]
Age Group	18-19	53	9.3	2.3	0.32	[8.7, 9.9]
	20-21	60	9.9	2.5	0.32	[9.3, 10.5]
	22-25	22	10.1	2.6	0.56	[9.0, 11.2]
	26+	9	11.6	3.4	1.13	[9.3, 13.8]
Primary Major	Business	14	11.3	2.3	0.61	[10.1, 12.5]
	Non-Business	130	9.7	2.5	0.22	[9.2, 10.1]

Note. Test score reflects number of correct responses on a 17-item financial literacy test.

Based on measures of central tendency, financial literacy increased with age, with undergraduate students 26 years of age and older having achieved the highest mean test score, $M=11.6$ ($SD=3.4$), corresponding to a 68% correct response rate on the 17-item financial literacy test. Among the higher scoring students were males ($M=10.3$, $SD=2.5$) and students whose primary major was business ($M=11.3$, $SD=2.3$). A frequency distribution by age of students with business as a primary major in college was run to determine whether the business majors also tended to be older students who declare business as a major later versus earlier during their matriculation. The frequency distribution by age for business majors indicated that, indeed, students in the youngest age group, 18- and 19-year-olds, represented

28.6% of the distribution, whereas students 21 years of age and older represented the remaining 71.4% of business majors.

Evaluation of Financial Literacy Test Items

For the 17-item financial literacy test used in this study, two indices evaluating effective construction of its test items were calculated. The item difficulty index was used to measure the students' level of difficulty in selecting the correct response for an item. The item discrimination index provided important information on performance differences of the examinees by providing a ratio of correct response rates for students who scored higher on the overall exam versus those who scored lower.

The item difficulty index refers to the proportion of examinees identifying the correct response to a test item. The index ranges in value from zero to one where lower values of the index indicate that items which are more difficult for the examinees. Item difficulty indices for 10 of the 17 items used for the current study's financial literacy test fell within the range of 0.3 to 0.7, defined as optimal for maximizing the information the test provides regarding differences between the knowledge, skills, or abilities of the examinees (Gregory, 2011). Results for item difficulty indices for the current study's financial literacy test are summarized in Appendix D, Table D3, Item Difficulty Indices of Financial Literacy Test Items. Optimal levels of item difficulty should also be greater than the chance of guessing. The financial literacy test used in the current study had four item choices for each question, which resulted in one in four or a 25% chance of guessing the correct answer. One test item fell below the 25% chance level of guessing. Item 42 on the survey questionnaire asked,

“Which is NOT a way to track your spending?” inviting inquiry into whether the examinees may have missed the negative connotation of the question.

Effective test items discriminate between high scorers and low scores on an exam (Gregory, 2011). An ideal test item would be one where high scoring examinees chose correctly, while low scorers chose incorrectly. The item discrimination index was used to measure how efficiently an item discriminated between examinees who achieved high scores versus those who achieved low scores on the entire exam. The first step was to calculate an overall financial literacy test score. The undergraduate college students’ overall financial literacy test score was based on the sum of correct responses to the 17 test items. Based on a frequency distribution of overall test scores, the upper and lower quartiles were identified. The upper quartile consisted of examinees whose total number of correct items was 12 or higher, while the lower quartile consisted of examinees whose overall test score was 7 or lower. For each test item, the item discrimination index was calculated using the formula, $d = (U - L)/N$. In the formula’s denominator, N was determined to be 36, representing one quarter of the n=144 participants in the sample. The value of U for each item was determined by summing the number of correct responses to a particular test item for examinees whose overall test score resided in the upper quartile. The value of L for each item was determined by summing the number of correct responses to that test item for examinees whose overall test score resided in the lower quartile. Item discrimination indices for this study’s 17 financial literacy test items are summarized in Appendix D, Table D4, Item Discrimination Indices of Financial Literacy Test Items. Values for the item discrimination

index can range from -1.0 to +1.0, with positive values being preferred and negative values indicating that an item needs revision. Item discrimination values for the 17 items on the current study's financial literacy test items were all above zero. One item had a particularly low discrimination index, item 51, which asked for a response to the statement, "A fraud scheme that relies on trust generated by association through group membership is..." The content of this particular test item seems likely to have been associated with the investor education module training to which the NCSU control group study participants were not exposed.

Reliability and Validity

Reliability is an important measure of internal consistency, or how well the test items associated with this study's construct of financial literacy test score were measured consistently among the survey participants. SAS JMP's Measurement and Systems Analysis procedure located in the Quality and Process Analysis tools menu was run to calculate the ICC coefficient. To be consistent with data input requirements for running the statistical procedure, the data were reorganized from columnar to row form, meaning that for each participant and each test item, the test item responses were re-aligned from columns to rows. Also, a new dichotomous response variable was created to recode the discrete choice answers, with a one assigned to a correct response and a zero for an incorrect response. The realigned data were entered into the procedure, in which the recoded dichotomous variable was used for the response role, the participant Id was used for the grouping role, and the question number was used for the part or unit's measured role. Defaults for model

characteristics were left in place, the MSA method was set to EMP, chart dispersion type was set to range, and model type was set to a value of crossed. The resulting ICC coefficient, with bias, was .79 which is at the top of a second class rating. This study's ICC coefficient was only one-hundredth of a point below a first class rating's lower threshold of .80. The importance of using the ICC statistic with bias was to take into account factors such as the operator or instrument's impact on consistency of measurement. This study's ICC coefficient was interpreted using the monitor classification legend that accompanied the EMP results in the SAS JMP Measurement and Systems Analysis procedure (see Appendix D, Figure D3). Based on information in the monitor classification legend, this study's ICC coefficient, .79, indicated the probability of measurement error fell within a range from one percent to 12%. The study's nearly first class rating as evidenced by the ICC coefficient indicated that the measurement system performed with acceptable consistency, meaning the discrete answer, multiple choice format used for the test items was suitable for measuring the financial literacy of undergraduate college students.

Validity is the extent to which a test measures the construct it claims to measure, which in this study was financial literacy. Content validity was measured by inter-rater consensus from a panel of five expert judges using a four-point Likert scale item for rating each test item. The ratings were ranked as follows: 1= not relevant, 2=somewhat relevant, 3=quite relevant and 4=very relevant. For each judge, the number of items rated 4=very relevant was divided by the sum of items rated 1, plus items rated 2, plus items rated 3 plus items rated 4. A summary of the calculated coefficients based on the judges' feedback can

be found in Appendix D, Table D5, Content Validity Coefficients for Inter-Rater Consensus by a Panel of Expert Judges. The average coefficient resulting from the panel ratings was 0.42. Although low, the rating is within a range of .40 to .60, not uncommonly seen on first-use test instruments (Gregory, 2011). Measures of central tendency were also calculated to further evaluate the panel's judgment of the test of financial literacy. Results of the means analysis can be found in Table 4.9, Expert Judges Panel Ratings for the 17-item Financial Literacy Test.

Table 4.4. Expert Judges Panel Ratings for the 17-item Financial Literacy Test

	Mean	SD	SE	95% CI
5-Judge Panel Average	3.1	0.9	0.10	[2.9, 3.3]
Judge 1	3.5	0.6	0.15	[3.1, 3.8]
Judge 2	2.8	0.9	0.22	[2.3, 3.2]
Judge 3	3.0	1.1	0.27	[2.4, 3.6]
Judge 4	2.8	0.9	0.21	[2.4, 3.3]
Judge 5	3.4	0.9	0.21	[3.0, 3.9]

Note. Judges ratings for the financial literacy test items were based on 4-point Likert scale responses where 1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, 4 = very relevant.

The four Likert scale responses were dichotomized into two groups: stronger item relevance having judge's ratings of 3 or 4, and weaker item relevance having ratings of 1 or 2. The 5-judge panel average rating (M=3.1, SD=0.9) resided in the group corresponding to stronger test item relevance.

Predictive Models

The three predictive models for the current study were created using SAS JMP statistical software. Model one's 15 predictors based on existing research in the financial

literacy of college students have been previously identified in the methodology chapter.

Prior to creating regression model two, bivariate correlations were run to identify which self-efficacy and financial behavior predictors would be used and which would be omitted.

Model one was created using the SAS JMP Fit Model procedure for stepwise multiple regression with a forward direction. Model one's regression control stopping rule was based on p-value threshold with the probability for predictors to both enter and leave the model was set at statistical significance level of .10. All 15 predictors were entered into the model at the beginning of the procedure: age, gender, business major, self-confidence in managing finances, self-confidence in reducing spending, self confidence in using credit cards less often, self-confidence in controlling debt, motivation toward managing finances, motivation toward reducing spending, motivation toward using credit cards less often, motivation toward controlling debt, having a student loan, having used a pawn shop, having opened a savings account and having invested in bonds. Undergraduate college students' financial literacy test scores were regressed on the linear combination of model one's 15 predictors. Six statistically significant predictors were identified in model one: age, female gender, business major, motivation toward managing finances, motivation toward using credit cards less and having used a pawn shop. The six predictors combined explained 24% of the variation in undergraduate college students' financial literacy test scores, $R^2=.24$, $\Delta R^2=.20$, $F(6, 137) = 7.14$, $p < .0001$. A summary of the results based on predictive model one were combined in a comparative view with those of model two and can be found in Table 4.5, Predictors of Undergraduate Students' Financial Literacy, which follows the discussion of the process for

selecting model two's predictors. Model one's effect size of $R^2=.24$ fell within the range of .18 to .32 which was seen in regression models from existing research investigations discussed in chapter two's literature review (Norvilitis, Merwin, Osberg, Roehling, Young & Kamas, 2006; Peng, Bartholomae, Fox & Cravener, 2007; Beal & Delpachitra, 2003; Murphy, 2005; Eitel & Martin, 2009; Seyedian & Yi, 2011).

For model two, a different approach was used to determine its predictors based on the current study's exploration grounded in Self-Efficacy Theory. Bivariate correlations were run to find items within the same area of inquiry that were highly correlated. Based on pairwise correlations, one of the two items having higher correlations was discarded. For the 16 motivation items, higher correlations were found among a number of the savings-related items as well as among investing related items. A threshold of 0.70 was used to eliminate eight of the motivation items which left eight motivation items retained in the model. The eight items retained were associated with motivation toward: managing finances, reducing spending, saving for an emergency, using credit cards less often, controlling debt, planning for future savings, investing in the stock market, and managing a 401K retirement plan.

For the 17 self-confidence items, higher correlations were found among a number of the investing-related items and items related to future savings. A threshold of 0.60 was used to eliminate eight of the self-confidence items resulting in the retention of nine self-confidence items. The nine items retained in model two reflected student self-confidence toward: managing finances, reducing spending, increasing savings, determining spending

based on income, saving for an emergency, using credit cards less often, repaying debt, investing knowledge, and saving for retirement.

For the 16 financial behavior items captured via dichotomous yes/no response choices, bivariate correlations proved ineffective for culling any items. Instead, in order to maintain a 5:1 ratio of predictors to observations, other techniques were used. Frequency distributions were run and then used to cull out financial behaviors in which less than 3% of respondents participated so as not to skew the results based on behaviors of a very limited set of participants. Financial behaviors in which more than 97% of respondents participated were also removed, as highly common behaviors among the predominant proportion of students in the sample are not likely to become statistically significant predictors of financial literacy test scores. The item associated with having opened a savings account was removed as well because 90% of participants had participated in this financial behavior. As a result of the omissions, eight of 16 items were eliminated, leaving eight items remaining as financial behavior predictors in model two. The eight predictors retained in model two reflected student participation in these specific financial behaviors: student loans, auto loans, pay day loans, use of a pawn shop, use of layaway, investing in bonds, investing in mutual funds, and investing in the stock market.

To this point, the eight motivation items, plus the nine self-confidence items, plus the eight financial behaviors summed to a total of 25 predictors for model two. The same three demographic predictors used in model one, age, gender, and business major were also used

for model two, bringing its total number of predictors up to 28. With a sample size of $n=144$ and 28 predictors, model two had a ratio of 5:1 observations to predictors.

Undergraduate college students' financial literacy test scores were regressed on the linear combination of model two's 28 predictors. Ten statistically significant predictors resulted from the model: age, female gender, business major, self-confidence in repaying debt, self-confidence in understanding how to invest their money, self-confidence in saving for retirement, motivation toward managing finances, motivation toward using credit cards less often, having used a pawn shop, and having invested in bonds inclusive of savings bonds. The ten predictors combined explained 32% of the variation in undergraduate college students' financial literacy test scores, $R^2=.32$, $\Delta R^2=.27$, $F(10, 133) = 6.30$, $p < .0001$. A comparative summary of results for predictive models one and two can be found in Table 4.5, Predictors of Undergraduate Students' Financial Literacy.

Table 4.5. Predictors of Undergraduate College Student Financial Literacy

Variable	Model 1			Model 2		
	β	SE		β	SE	
Intercept	4.95	1.72		3.32	1.74	
Age	0.12	0.06	*	0.18	0.06	**
Female Gender	-0.73	0.39	*	-0.90	0.38	**
Business Major	1.56	0.66	**	1.44	0.64	**
Self-confidence in repaying debt				0.46	0.26	*
Self-confidence in understanding how to invest money				-0.61	0.19	**
Self-confidence in saving for retirement				0.51	0.21	**
Motivation toward managing finances	1.22	0.29	***	0.90	0.30	**
Motivation toward using credit cards less	-0.60	0.20	**	-0.62	0.20	**
Use of pawn shop	-1.34	0.62	**	-1.17	0.59	*
Investing in bonds including savings bonds				0.79	0.47	*
F	7.14	***		6.30	***	
R ²	0.24			0.32		
Adjusted R ²	0.20			0.27		

Note. n=144.

* p <.10; **p <.05; ***p <.001.

With a refined focus on model two, only the 10 statistically significant predictors from model two were used for input into model three. The value-added aspect of model three came from its hierarchical design which emphasized how the predictors, entered in three distinct blocks based on each of the study's research questions, contributed to the model's overall effect size. The first-pass run began by including only block one's three demographic predictors comprising age, gender, and business major. Combined, the three demographic predictors in model three's first-pass run explained 9% of the variation in undergraduate college students' financial literacy test scores, $R^2=.09$, $\Delta R^2=.07$, $F(3, 140) = 4.72$, $p = .0041$. For the second-pass run, the five self-efficacy predictors comprising block two, self-confidence in repaying debt, self-confidence in understanding how to invest their money, self-confidence in saving for retirement, motivation toward managing finances, and

motivation toward using credit cards less often were added to block one's three demographic predictors for a total of eight predictors. The addition of the self-efficacy predictors had a large impact on the model, boosting its effect size by 20%. Combined, the three block one demographic predictors plus the five block two self-efficacy predictors in the second-pass run explained 29% of the variation in undergraduate college students' financial literacy test scores, $R^2=.29$, $\Delta R^2=.24$, $F(8, 135) = 6.79$, $p < .0001$. Predictors for the third-pass run included three block one demographic variables, five block two self-efficacy variables and two block three financial behavior variables, one each for having used a pawn shop and having invested in bonds inclusive of savings bonds, bringing the total number of predictors up to 10 for model three. For the third-pass run, the addition of block three's financial behavior predictors resulted in a 3% incremental increase in the model's overall effect size. The combination of all ten predictors (i.e., block one, two and three predictors) in the third-pass run explained 32% of the variation in undergraduate college students' financial literacy test scores, $R^2=.32$, $\Delta R^2=.27$, $F(10, 133) = 6.30$, $p < .0001$. A summary of model three's results can be found in Table 4.6, Hierarchical Model of the Predictors of Undergraduate Students' Financial Literacy. Last, reasonableness checks were run to verify the assumptions associated with the linear regression models, including: linearity, constant variance, normality in the distribution of y-values for a specific x-value, and independence between x-values and the y-value predictors. Frequency distributions were run to verify the normality of the distribution of predictors of financial literacy, resulting in a normal curve for each of

the models. Scatterplot graphs of the residuals were run, and neither lack of fit nor unequal variances were detected in the graphic output.

Table 4.6. Hierarchical Model of the Predictors of Undergraduate College Student Financial Literacy

Variable	<u>First-pass</u>		<u>Second-pass</u>		<u>Third-pass</u>	
	β	SE	β	SE	β	SE
Intercept	7.20	0.04	3.16	0.64	3.32	1.74
<i>Block 1 Predictors: Demographics</i>						
Age	0.14	0.06 **	0.16	0.06 **	0.18	0.06 **
Female Gender	-0.82	0.00 *	-0.86	0.39 **	-0.90	0.38 **
Business Major	1.48	0.02 **	1.31	0.64 **	1.44	0.64 **
<i>Block 2 Predictors: Self-Efficacy</i>						
Self-confidence in repaying debt			0.50	0.26 *	0.46	0.26 *
Self-confidence in understanding how to invest money			-0.62	0.20 **	-0.61	0.19 **
Self-confidence in saving for retirement			-1.17	0.59 **	0.51	0.21 **
Motivation toward managing finances			0.79	0.47 **	0.90	0.30 **
Motivation toward using credit cards less			0.00	0.00 **	-0.62	0.20 **
<i>Block 3 Predictors: Financial Behaviors</i>						
Use of pawn shop					-1.17	0.59 *
Investing in bonds including savings bonds					0.79	0.47 *
F	4.62 **		6.79 ***		6.30 ***	
R ²	0.09		0.29		0.32	
Adjusted R ²	0.07		0.24		0.27	

Note. n=144.

* p <.10; **p <.05; ***p <.001.

Chapter Summary

The findings chapter began with a review of descriptive statistics for three categories of predictors used this study's predictive models: self-confidence, motivation and financial behaviors of undergraduate college students. A summary of the students' average financial

literacy test scores for the dependent variable followed. Next, was an evaluation of the current study's financial literacy test instrument reviewing the test's construction, reliability, and validity. The chapter concludes with findings obtained from the three predictive models created for this study.

Predictive model one whose predictors were based on what was known from existing research identified six significant predictors of undergraduate college students' financial literacy including demographics, motivation and financial behaviors with an effect size of $R^2=.24$. Predictive model two whose predictors were based on the current study's exploration uniquely framed in Self-Efficacy Theory identified six significant predictors of undergraduate college students' financial literacy including demographics, self-efficacy and financial behaviors with an effect size of $R^2=.32$. Predictive model three, crafted using a unique hierarchical presentation based on the current study's three research questions, represented a refined version of model two's results which emphasized the contribution that the second model's predictors, entered in additive blocks, made to the model's overall effect size.

CHAPTER 5

Summary, Conclusions, Implications and Recommendations

This quantitative study was primarily concerned with filling a gap in research investigations of the financial literacy of college students. It was hoped this study would pave new pathways for framing the concept of financial literacy through its examination into whether college students' self-efficacy and/or financial behaviors were useful in predicting the college students' financial literacy levels.

The chapter begins with an overview of the study. Next are a descriptive summary of undergraduate college students' financial experiences and then a summary of the current study's predictive model findings. Conclusions follow, and implications and recommendations for research, education practice and policy are then presented. A chapter summary concludes chapter five.

Overview of the Study

This study was an exploration into the predictors of the financial literacy of undergraduate college students. As an extension of its exploration, the study also provided descriptive data regarding undergraduate college students' financial experiences. Toward those objectives, this study was grounded in Self-Efficacy Theory, a framework not yet used in research investigations in the financial literacy of college students. The population for the study was undergraduate college students enrolled in a research-intensive land-grant university in North Carolina during the fall semester of 2010. The target sampling frame consisted of approximately 2000 randomly selected students from the population. The

sampling unit was the individual student who responded to an email inviting them to participate in a web-based survey by clicking on a link embedded within the email invitation. The methodology for this non-experimental study had a predictive and explanatory focus.

Three research questions guided the current study's exploration of the predictors of the financial literacy of college students. The first research question inquired whether college students' self-efficacy would be useful in predicting the students' financial literacy. The second question sought to determine whether financial behaviors were useful for predicting the financial literacy of college students. The third question was concerned with which demographic characteristics described who is more financially literate among college students.

Data were analyzed using statistics-based procedures including univariate and bivariate analysis and multiple regression modeling. Three distinct predictive models resulted from the data analysis component of this study. The third predictive model, unique in its hierarchical design, was created to correspond directly to each of the study's three research questions. Prior to presenting a summary of this study's predictive model results, a descriptive summary of undergraduate college students' financial experiences is presented.

Descriptive Summary of Undergraduate College Students' Financial Experiences

While results from the multiple regression models identified predictors of undergraduate college students' financial literacy in direct response to this study's research questions, the following summary serves to broaden the understanding of the students' financial experiences based on descriptive statistics obtained from students in the study's

sample. Descriptive summaries of undergraduate college students' financial experiences were developed based on the students' self-efficacy toward their financial abilities, their financial behaviors, and Personal Financial Wellness scores.

Undergraduate College Students' Self-efficacy toward their Financial Abilities

In the current study, self-efficacy represented a composite of the students' beliefs, attitudes, and values toward their financial abilities, inclusive of measures of both self-confidence and motivation. Measures of central tendency, indicating the students' average ratings of their self-efficacy in various financial abilities provided a helpful summary of two important behavior-related influences.

Among undergraduate college students' self-confidence ratings across 17 different financial abilities, the students reported having the lowest self-confidence in understanding how to invest in the stock market. Five of the students' lowest self-confidence ratings fell under the area of investments, the four other self-confidence ratings corresponded to recognizing an investment scheme, understanding how to invest money in general, protecting themselves against investment fraud, and managing their investments (see Appendix D, Table D1, Undergraduate College Students' Self-Confidence Ratings toward their Financial Abilities).

The five financial abilities for which students reported having the highest self-confidence included using credit cards less often, making a plan for future savings, controlling debt, repaying debt and saving for the future. Three of these abilities involved future-oriented abilities, specifically making plan for future savings, repaying debt and

saving for the future. Undergraduate college students' higher self-confidence in their future financial abilities may be linked to what has been termed "the graduation cure" by researchers. Research has indicated that college students tend to look toward graduation as a cure for addressing financial challenges, resting their hope on obtaining employment in good paying jobs upon graduating from college (Eitel & Martin, 2009).

In direct contrast to their high self-confidence rating for using credit cards less often, the students' next to lowest motivation rating across 16 financial abilities was toward using their credit cards less often. Lower motivation by undergraduate students toward restricting credit card use may be directly related to the passing of the Credit Card Act of 2009, which greatly restricted students under the age of 21 from obtaining credit cards in their own name. Lack of a credit card or having credit cards in their parents' name may be related to undergraduate students' lower motivation toward using credit cards less often. Other than credit card use, investment-related abilities had the lowest motivation ratings among the students. The investment-related abilities for which students had the lowest motivation included: understanding how to invest in the stock market, managing their investments, saving for retirement, and managing their 401K/Retirement account. The students' lower motivation toward financial abilities regarding investments and retirement may be related to the fact that abilities in managing investment or retirement accounts are neither relevant nor pertinent to day-to-day undergraduate college student financial experiences.

Both convergence and divergence were found between undergraduate students' self-confidence and motivation ratings toward specific financial abilities. Lower ratings for both

self-confidence and motivation in investing-related financial abilities including retirement account management were found among the undergraduate students. This convergence seemingly had a logical basis as the students exhibited low motivation toward future-oriented financial abilities typically connected with full-time employment in the workforce for which they also lacked self-confidence. Diverging results indicating undergraduate college students had the highest self-confidence in their ability to use credit cards less often versus lowest motivation toward restricting their credit card use was linked to the passage of the Credit Card Act of 2009.

Undergraduate Students' Financial Behaviors

Frequency distributions were used to identify which financial behaviors were most or least common among undergraduate college students. Lusardi's (2009) typology of four classes of financial transactions was used in the current study for grouping financial behaviors. The four classes included: (1) use of traditional sources for borrowing excluding credit cards; (2) use of alternative sources for borrowing; (3) methods of saving, investing and paying; and (4) credit card use.

In the current study, traditional borrowing sources for the first class of financial behaviors included: student loans, auto loans, home equity loans, mortgage loans, and installment loans. Student loans were the most prominently represented traditional borrowing source, with 58% of students in the sample carrying student loan debt. The proportion in the sample was higher than the national average for students attending public four-year institutions for which the percentage of undergraduate college students who

financed their education with student loans was 50% (National Center of Education Statistics, 2013). Slightly under 12% of the undergraduate students in the sample reported having car loan debt, while for those having home equity loans, mortgage loans or installment loans the proportions of students were lower than 4% of the total sample n=144.

Second, financial behaviors for alternative sources borrowing in this study included: pay day loans, income tax refund anticipation loans, auto title loans, use of pawn shop, use of layaway for purchases, and rent to own agreements. Of the alternative sources financial behaviors, none were used by a majority of the students. Use of a pawn shop was the most prevalent alternative source for borrowing among the students in the sample with 11% proportionately having used this method. All other alternative sources for borrowing were used by less than 10% of this study's undergraduate college students.

Third, methods of saving and paying were financial behaviors in which the undergraduate students had the highest level of engagement. A very large proportion, 98% of students had opened either a checking or debit card bank account, while 90% had opened savings accounts. Participation was considerably lower among the undergraduate students for financial behaviors concerned with investing. Investment in bonds inclusive of savings bonds was the most common investing-related financial behavior with the proportion of students who participated in investing in bonds at 22%, while students who invested in mutual funds were proportionately represented 17%, and students who invested in the stock market had the lowest of the three proportions at 16%.

The fourth and final class in Lusardi's (2009) typology was credit card use. In this study's sample a little more than half of the undergraduate students, 55%, reported having zero credit cards in their own name, while another 28% held only one credit card in their own name. Reductions in the number of credit cards obtained under the student's names as well as the amount of credit card debt carried by college students have been attributed to restrictions from The Credit Card Act of 2009 in conjunction with economic pressures resulting from the great recession of 2008 (Eferighe, 2013).

Undergraduate College Students' Personal Financial Wellness

While not used in this study's predictive models, Personal Financial Wellness (PFW) scores were useful in providing insight into undergraduate college students' state of self-assessed financial health, happiness, and freedom from financial worries (Copur & Bird, 2013). PFW score was a composite measure which incorporated aspects of both students' objective views on their current financial status, as well as the students' subjective attitudes about their financial-well being. Results from the current study confirmed Copur & Bird's (2013) findings regarding males' higher PFW scores in an international study of college students' personal financial wellness perceptions. Based on a 10-point rating scale, mean PFW scores for male students in this study were nearly one point higher than those of female students (see Chapter 4, Table 4.2, Undergraduate College Students' Personal Financial Wellness Scores). The one point spread on a 10-item scale amounts to 10%, indicating that male undergraduate college students' sense of personal financial well-being was 10% higher than that of their female cohorts.

In summary, this section provided descriptive summaries examining the students' self-efficacy toward their financial abilities, their financial behaviors, and Personal Financial Wellness scores in an effort to shed light on some indicators of undergraduate college students' financial experiences. The next section provides a summary of findings for this study's predictive models.

Summary of Predictive Model Findings

Using multiple regression, three distinct predictive models were created for this research investigation. All three models used the same dependent or response variable, financial literacy test score. The selection process for the predictor variables differed for models one and two based on the premise under which each predictive model was created.

The selection of model one's predictors was based on important findings from selected research studies of the financial literacy of college students. Beal & Delpachitra's (2003) regression model of the predictors of financial literacy of Australian university students found two statistically significant predictors associated with college students' higher financial literacy test scores, male gender, and higher income levels. A second study by Eitel & Martin (2009) produced a regression model of the predictors of financial literacy among first generation female college students, revealing the predictors of greater age, Caucasian ethnicity and higher class rank were associated with higher college student financial literacy test scores. Among the significant predictors in a third regression model predicting investment knowledge among Midwestern college alumni were having an occupation in business (Peng, Bartholomae, Fox & Cravener, 2007). Guided by research, the

undergraduate college student demographic predictors chosen for model one in the current study were age, gender and business as a primary major in college.

Motivation has been linked to financial literacy in research. Mandell and Klein (2007) found the use of variables which captured student motivation significantly increased their ability to explain differences in financial literacy test scores among 17 and 18 year old students. While little or no empirical evidence exists regarding financial behaviors as predictors of financial literacy, Lusardi (2009) provided a typology of four classes of financial transactions used for grouping the financial behavior predictors in this study. The four classes included: (1) use of traditional sources for borrowing excluding credit cards, (2) use of alternative sources for borrowing, (3) methods of saving, investing and paying and (4) credit card use. Guided by existing research, three demographic predictors, four predictors each of motivation and self-confidence toward financial abilities, and four financial behavior predictors were incorporated into model one for a total of 15 predictors.

Of the 15 predictors input into predictive model one, six statistically significant predictors of undergraduate college students' financial literacy resulted. The linear combination of model one's six predictors explained 24% of the variation in undergraduate college students' financial literacy test scores (see Chapter 4, Table 4.5, Predictors of Undergraduate Students' Financial Literacy). Three of the six predictors pertained to student demographics: age, gender and business major. Model one's results indicated that financial literacy test scores were higher for older undergraduate students as well as for students who

had business as a primary major in college, while financial literacy test scores were lower for female students.

Two of model one's six statistically significant predictors were concerned with undergraduate college students' motivation toward their financial abilities. Financial literacy test scores were found to be higher among students who were more highly motivated toward managing their finances. Financial literacy test scores were found to be lower among students who reported less motivation toward restricting their credit card use. The last of model one's six statistically significant predictors was concerned with a particular financial behavior of undergraduate students, using pawn shops as an alternative borrowing source. In predictive model one, financial literacy test scores were found to be lower among students who reported using pawn shops as an alternative source for borrowing.

For predictive model two, selection of the predictor variables was based on the current study's exploration uniquely grounded in Self-Efficacy Theory. At its onset, a total of 29 predictors were input into predictive model two. From its original 29 predictors, ten statistically significant predictors of undergraduate college students' financial literacy were identified by model two. Student demographics was the one area where the predictors entered into both models one and two were the same. Three of model two's ten significant predictors pertained to student demographics: age, gender and business major. In model two, financial literacy test scores were higher for older undergraduate students and also for those having business as a primary major in college, while lower financial literacy test scores were associated with female students.

Five of model two's ten statistically significant predictors were concerned with undergraduate college students' self-efficacy. Self-efficacy included measures of student self-confidence and motivation toward certain financial abilities. In model two, financial literacy test scores were found to be higher among students who had greater self-confidence in repaying their debt, greater self-confidence in saving for retirement, and greater motivation toward managing their finances. In contrast, model two's results indicated that financial literacy test scores were lower among students who reported less self-confidence in understanding how to invest money, as well those with lower motivation toward using credit cards less often. The last of model two's ten statistically significant predictors were concerned with financial behaviors of undergraduate students. In predictive model two, financial literacy test scores were found to be lower among students who reported using pawn shops as an alternative source for borrowing, while financial literacy test scores were higher among students who had invested in bonds inclusive of savings bonds. Results of predictive models one and two are shown in side by side comparison in chapter 4, Table 4.5, Predictors of Undergraduate College Students' Financial Literacy. In this comparison, model two's predictors based on the current study's exploration in self-efficacy were collectively able to explain considerably more variation in undergraduate college students' financial literacy test scores, $R^2=.32$, than were model one's predictors based on what was known from existing research $R^2=.24$.

Model three represented a refined version of model two's results. Selection of the predictors for model three was restricted to only those ten predictors having statistical

significance based on model two's results. Unique to model three's design was its hierarchical organization which corresponded to each of this study's three research questions. In predictive model three the predictor variables relating to each research question were organized and entered into the model in three distinct blocks, undergraduate college students' demographics, self-efficacy, and financial behaviors. Three different passes of model three were run, with each pass having its blocks of predictors entered in an additive sequence. The first-pass run of predictive model three included only the three demographic predictors comprising block one. Block one's three demographic predictors included age, gender and business as a primary major in college. For the second-pass run, the three demographic predictors comprising block one plus the five self-efficacy predictors comprising block two were input into the model. Block two's five self-efficacy predictors included self-confidence in repaying debt, self-confidence in understanding how to invest money, self-confidence in saving for retirement, motivation toward managing finances, and motivation toward using credit cards less often. For the third-pass run, the three demographic predictors comprising block one, plus the five self-efficacy predictors comprising block two, plus the two financial behavior predictors comprising block three were input into the model. Block three's two financial behavior predictors included using a pawn shop as an alternative borrowing source and investing in bonds inclusive of savings bonds. The resulting hierarchical model yielded three separate effect sizes as measured by r-squared. Effect size increased incrementally with the additive blocks of predictors from $R^2=.09$ for the first-pass run, to $R^2=.29$ in the second pass run, to $R^2=.32$ in the third-pass run of model three. The

linear combination of model three's ten predictors explained 32% of the variation in undergraduate college students' financial literacy test scores (see Chapter 4, Table 4.6, Hierarchical Model of the Predictors of Undergraduate College Student Financial Literacy).

A contribution unique to predictive model three's hierarchical presentation was that its particular organization provided an opportunity to identify the impact of the predictors' input in a three-pass series of runs using additive hierarchical blocks of the predictors for each of the passes. Further, each block of predictors corresponded to one of this study's three research questions. Block one's demographic predictors used alone in the first-pass run accounted for 28% proportionately of model three's overall effect size at the end of the third pass (i.e., $R^2=.09$ of $R^2=.32$). The addition of the block two self-efficacy predictors to the block one demographic predictors in the second-pass run had the greatest impact on model three's overall effect size, boosting it considerably from $R^2=.09$ to $R^2=.29$. The linear combination of the block one and two predictors accounted for 91% of model three's total effect size proportionately (i.e., $R^2=.29$ of $R^2=.32$). The addition of the block three financial behavior predictors block one's demographic and block two's self-efficacy predictors had the least overall impact, raising the model three's total effect size from $R^2=.29$ to $R^2=.32$, adding another 9% proportionately to the overall effect size at the end of the model's third pass run. Conclusions linking this study's research questions and findings and will be discussed in the next section.

Conclusions

Findings from this study lead to three main conclusions. First, self-efficacy predictors had the greatest amount of influence on the overall effect size of a model predicting the financial literacy of undergraduate college students. Second, financial behaviors of undergraduate college students were found to be statistically significant predictors of the financial literacy of undergraduate college students. Third, older students and those with a business as primary major in college were more financially literate, while results indicated that female students were not more financially literate. Also related to the third research question, this study confirmed that student demographics are, in fact, important predictors of undergraduate college students' financial literacy.

The first conclusion from this study was that self-efficacy variables were highly impactful statistical predictors of undergraduate college students' financial literacy. The goal of the first research question was to explore whether self-efficacy was useful in predicting the financial literacy of undergraduate college students. There were two reasons for focusing on self-efficacy predictors in the current study. One reason was to fill a gap in research investigations of college students by exploring the role that self-efficacy had in quantitative studies explaining the variation in college students' financial literacy test scores through the use of predictive modeling. The current study's literature review provided background on how self-efficacy, an important behavioral influence, had thus far been overlooked among studies in the financial literacy of college students. Secondly, the current study responded to calls from the research community suggesting the need for further exploration into college

students' behavioral drivers toward their financial abilities including motivation and/or self-confidence (Mandell & Klein, 2007; Shim, Barber, Card, Xiao & Serido, 2010).

Based on findings from the current study, self-efficacy variables provided the most influence as predictors of undergraduate college students' financial literacy when evaluated in linear combination along side of financial behavior and demographic predictors. This was evidenced in predictive model three in which the addition of block two's five self-efficacy predictors in linear combination with the demographic predictors more than tripled the model's overall effect size from $R^2=.09$ to $R^2=.29$, which was a startlingly high impact.

The second conclusion arising from this study's findings was that financial behaviors were found to be statistically significant predictors of the financial literacy of undergraduate college students. The aim of research question two was to explore whether financial behaviors of undergraduate college students were useful in predicting their financial literacy. An argument was made in chapter one that little if any research in the financial literacy of college students focused on examining which specific financial behaviors could be used to predict the students' financial literacy levels. Other than for predictive modeling of college students' financial literacy, alternative research investigations involving college students' financial behaviors exist. A number of selected studies in the financial literacy of college students provided descriptions of the types of financial behaviors in which college students engaged (Borden, Lee, Serido & Collins, 2007; Eitel & Martin, 2009; Lyons, 2007; Norvilitis, Merwin, Osberg, Roeling, Young & Kamas, 2006). Other studies categorized the financial behaviors of college students into groupings, such as desirable versus undesirable

(Cude, Lawrence, Lyons, Metzger, LeJeune, Marks & Machtmes, 2006), healthy versus unhealthy (Everfi and Higher One, 2014), or risky versus cautious (Shim, Serido & Xiao, 2009). Findings from the current study's predictive model three provided statistical evidence that using a pawn shop as an alternative borrowing source and having invested in bonds were useful as predictors of the financial literacy of undergraduate college students.

A third conclusion arising from this study's findings was affirmation that student demographics, specifically age, female gender and having business as a primary major in college, serve as important predictors of undergraduate college students' financial literacy. The selection of college students' demographic variables used as predictors in the current study's multiple regression models was guided by existing research. Beal & Delpachitra (2003) found that male gender was associated with higher financial literacy among Australian university students. Eitel and Martin (2009) revealed that higher class rank was associated with higher college student financial literacy test scores among first generation female college students. Peng, Bartholomae, Fox and Cravener (2007) found investment knowledge was higher for males and business professionals among Midwestern college alumni. An unanticipated result from the current study's findings indicated that three student demographics: age, gender and business as a primary major in college in linear combination made a sizeable contribution, 28% proportionately, to predictive model three's overall effect size of $R^2=.32$. Another way of interpreting this impact is that this study's demographic predictors as a group accounted for between one-quarter and one-third of predictive model's overall effect size, which is a sizable impact underscoring the importance of including

demographics as predictors of undergraduate college students' financial literacy. Having presented this study's conclusions, implications and recommendations are discussed in the next section.

Implications and Recommendations

This section highlights implications from the study and offers recommendations for both research and practice. Implications for policy are provided with hope that this study's important findings provide interesting new insights which may help precipitate a revisitation of established paradigms in financial literacy policy.

Implications and Recommendations for Research

The current study accomplished one of its main objectives, filling a gap in research investigations in the financial literacy of college students with its unique framework grounded in Self-Efficacy Theory (Bandura, 1994). An implication for research is that the study provides a new conceptual basis delineating the foundation of the concept of financial literacy by providing empirical evidence of behavior-based predictors of the financial literacy of college students. This study's findings support the notion that undergraduate college students' financial behaviors along with a key behavioral influence, self-efficacy, can be used to predict the students' financial literacy with an appreciable effect size.

In addition to implications, three recommendations for research are offered based on this study's findings. First, further quantitative studies which incorporate self-efficacy as a predictor of undergraduate college students' financial literacy could serve to affirm and extend explanatory research addressing the phenomenon of the financial literacy of college

students. Second, self-efficacy is a contextual capability, so it is important that financial self-efficacy be appropriately contextualized within future research investigations. Third, qualitative research initiatives which use an inductive approach may be beneficial in further delineating college students' financial self-efficacy. Inductive research methods create a layer of richness by providing the researcher with multiple approaches to answer research questions in less constrained and restrictive ways, allowing the researcher to have more choices to discover and uncover critical information (Creswell 2009; Johnson & Onwuegbuzie, 2004).

Implications and Recommendations for Education Practice

Financial literacy is a practical and applied discipline which arose to effectively cope with the societal need to maintain one's financial well-being in a capitalist economy. In this vein, financial literacy has not only been an emerging interdisciplinary body of knowledge, but is also an area of professional practice. The implication for education practice resulting from this study is that the study highlights undergraduate college students as a special group of learners, emerging adults, who are at the beginning of a transformational journey in becoming financially independent contributors in our capitalist society. A prime opportunity exists for educators to facilitate the students' financial learning, development and growth during the students' emerging adult years.

Two recommendations for education practice are presented in the form of suggestions for financial literacy program practitioners. One, this study found evidence that a targeted focus on financial behaviors which are of relevance and interest to college students could be

used to create financial literacy programs that better capture and maintain the students' interest. For example, college students could benefit from the knowledge that alternative borrowing sources other than pawn shops may more prudently serve their needs when they find themselves in a cash crunch. A second recommendation based on this study's conclusions suggests that programs could target emerging young adults' self-efficacy in an effort to instill more motivation and self-confidence toward their finances among college students. Increases in these two behavioral influences can serve to better prepare the students to adapt to new, challenging and ever more sophisticated financial demands that arise in our country's dynamic capitalist economic arena. As soon as students enter the workforce, many will find their employers offer options for investing in the stock market as part of an employee benefit plan, yet investing in the stock market was a financial ability where the students indicated having the least self-confidence.

Implications for Policy

The current study highlights college students as a financially at-risk population who would benefit from better retention of financial knowledge, skills and abilities delivered through quality financial education programs. Policy makers may gain insight from this study that would be useful in defining goals and standards pertaining specifically to the financial literacy of college students, who constitute a very special group of young adults in U.S. society.

Chapter Summary

This chapter began with an overview of the study, followed by a synopsis of the study's findings, functionally split between a descriptive summary of undergraduate college students' financial experiences and an explanatory summary of the study's predictive model results. Next, three conclusions corresponding directly with each of the study's research questions were presented. Following the conclusions, implications and recommendations for research, education practice and policy were offered.

In the research community, this study has added to the body of knowledge in the financial literacy of college students by providing empirical evidence for previously unstudied behavior-related predictors of college students' financial literacy.

Recommendations which may be useful for optimizing the impact of financial literacy programs for college student were offered to financial literacy program practitioners. The current study further offers new evidence for consideration and discussion among financial literacy program practitioners and policy makers. The evidence in particular emphasizes the importance of behavior-related predictors associated with the financial literacy college students who constitute a special group of learners, emerging adults.

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APPENDICES

Appendix A

Table A1. Predictors of the Onset of Credit Card Debt among College Students

Variable	β
Number of credit cards held	0.26***
Age	0.25***
Delay of Gratification	0.20**
Credit card use	0.15*
Financial literacy test score	0.15*
R ²	0.26

Note. Coding of Variables, Number of Credit cards held: aggregate # of major (i.e. Visa, Mastercard) plus store credit cards held; Age: 5 age categories, 18-19; 20-21; 22-23; 24-25; 26+; Delay of gratification: aggregate of 12 delay of gratification question responses scored using values= yes/no/unsure; Credit card use: aggregate of 13 5-item Likert scale credit card use question responses; Financial literacy test score: aggregate total # correct responses on test of 31 questions.

Adapted from "Personality Factors, Money Attitudes, Financial Knowledge, and Credit-Card Debt in College Students," by Norvilitis, J. M., Merwin, M. M., Osberg, T. M., Roehling, P. V., Young, P., and Kamas, M. M. (2006), *Journal of Applied Social Psychology*, 36(6), 1395-1413. Copyright 2006 by Blackwell Publishing, Inc.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table A2. Predictors of Investment Knowledge among Midwestern College Alumni

Variable	β
Constant	1.14
High school finance class	-0.32
College finance class	0.73**
Both high school and college finance class	0.14
Graduate school finance class	0.13
Parent's savings habits	-0.01
Held bank account before age 18	0.59**
Held bank account before age 16	0.21
Currently hold stock or bond	1.62***
Business owner	-0.00
Home owner	-0.14
Earned income in \$ thousands	0.01***
Received inheritance or gift	0.14
Occupation = business or professional	0.69***
Black race	-0.13
Asian race	-0.18
Other race	-0.58
Male genders	1.75***
Age	0.01
Marital status	1.14
R ²	0.26

Note. Coding of variables, High school class in finance: 1 = yes, 0 otherwise; College class in finance: 1 = yes, 0 otherwise; High school & college finance 1 = yes, 0 otherwise; Graduate school: 1 = yes, 0 otherwise; Parents' savings habits: 5-item Likert scale ranging from 1=parents saved a lot less than others to 5=parents saved a lot more than others; Held bank account before 18: 1 = yes, 0 otherwise; Held bank account before 18: 1 = yes, 0 otherwise; Currently hold stock or bond: 1 = yes, 0 otherwise; Business owner: 1 = yes, 0 otherwise; Home owner: 1 = yes, 0 otherwise; Earned income \$ thousands: continuous variable provided by respondent; Inheritance or gift: 1 = yes, received, 0 otherwise; occupation business/professional: 1 = yes, 0 otherwise; Black race: 1 = yes, 0 otherwise; Asian race: 1 = yes, 0 otherwise; Other race: 1 = yes, 0 otherwise; Male gender: 1 = yes, 0 otherwise; Age: continuous variable provided by respondent; Marital status: 1 = yes, 0 otherwise.

Adapted from "The Impact of Personal Finance Education Delivered in High School and College Courses," by Peng, T., Bartholomae, S., Fox, J., and Cravener, G. (2007), *Journal of Family and Economics*, 28(2), 265-284. Netherlands: Springer. Copyright 2007 by Springer Science+Business Media, LLC.

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

Table A3. Predictors of Financial Literacy of Australian University Students

Variable	β
Constant	0.06
Major	0.87
Gender	0.37*
Number of immediate family members	0.13
Age	0.13
Education	-0.08
Occupation	0.07
Employed?	0.07
Experience	0.32
Income	0.16*
Risk preference	-0.16
R ²	0.18

Note. Coding of variables, Major: 1 = business, 0 = Other; Gender: 1 = male, 0 = female; #Immediate family members: 1 = single person household, 2 = family with dependents, 3 = couple with no dependents; Age: age classes ranging from <18 years to >75 years+; Education: 5 values ranging from mid-secondary to postgraduate; Occupation: 7 classes ranging from unskilled student to retired individual; Employed?: 1 = unemployed, 0 = employed; Experience: 8 value classes ranging from 0 to >30 years; Income: 7 value classes ranging from <\$20k to >\$150k; Risk preference: aggregate of 4 Likert scale risk preference questions.

Adapted from “Financial Literacy Among Australian University Students,” by Beal, D., and Delpachitra, S. (2003), *Economic Papers*, 22(1), 65-78. Copyright 2003 by the Centre for Australian Financial Institutions at the University of Southern Queensland.

* $p < .05$

Table A4. Predictors of Financial Literacy of Students at a Predominantly Black University

Variable	β
Constant	0.77
Race	-1.43*
Gender	-0.38
Age	-0.12
Major	0.84
Parental education level	-3.43
R ²	0.28

Note. Coding of variables, Race: black = 1, 0 otherwise; Gender: female = 1, 0 otherwise; Age: 21+ = 1; 0 otherwise; Major: business = 1; 0 otherwise; Parental education level: high school = 1; 0 otherwise.

Adapted from "Money, Money, Money: An Exploratory Study on the Financial Literacy of Black College Students," by Murphy, A. J. (2005), *College Student Journal*, 39(3), 478-488. Copyright 2005 by Project Innovation, Inc.

* $p < .01$

Table A5. Predictors of Financial Literacy among First Generation Female College Students

Variable	B
Constant	38.83
Age	0.27*
Caucasian ethnicity	0.27***
Class rank	0.23**
R ²	0.32

Note. Coding of variables, Age: continuous variable as reported by the respondent; Caucasian ethnicity 1 = Caucasian, 0 otherwise; Class rank: 1= Freshmen, 2 = Sophomore, 3 = Junior, 4 = Senior. Adapted from “First-Generation Female College Students’ Financial Literacy: Real and Perceived Barriers to Degree Completion,” by Eitel, S.J., and Martin, J. (2009), *College Student Journal*, 43(2), 616-630. Copyright 2009 by Project Innovation, Inc.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table A6. Post-test Regression Model Results of a Financial Educational Intervention with College Students

Regression Model Category of Predictor Variables	R ²	Total number variables	Variables significant at p < .05	Variables significant at p < .10
Students' demographic profile	0.25	6	1. Employment history	1. Parents' highest level of schooling
Students' financial background	0.29	5	1. Ownership of credit card 2. Verify every checking account transaction, never bounced check	1. Do not verify every checking account transaction, but have bounced a check
Students' financial attitude and behavior	0.26	4	None	1. Find it tough to live on Social Security when older without much money saved and have good pension

Adapted from "Improving Financial Literacy of College Students: A Cross-Sectional Analysis," by Seyedian, M. A. & Yi, T. D. (2011), *College Student Journal*, 45(1), 177-189. Copyright 2011 by Project Innovation, Inc.

Appendix B

Figure B1. Investor Education for College Students – Control Group Posttest Survey

Note: Informed consent represents items 1,2 and 3 which precedes this survey

The set of questions below have to do with how you feel now, regarding your financial skills and ability to manage money

	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
4) I am confident that I can manage my finances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) I am confident that I can save for my future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) I am confident that I can reduce my spending.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) I am confident that I can increase my savings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8) I am confident that I can determine how much I can spend based on my income.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9) I am confident that I can save in case of an emergency.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10) I am confident that I can use my credit cards less frequently.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11) I am confident that I can control my debt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12) I am confident that I can make a plan for repaying my debt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13) I am confident that I can make a plan for saving for the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14) I am confident that I understand how to invest my money.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15) I am confident that I can manage my investments.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16) I am confident that I can save for retirement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17) I am confident that I understand how to invest in the stock market.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18) I am confident that I can recognize an investment scheme.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19) I am confident that I can protect myself against investment fraud.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20) I am confident I can/will be able to manage my employer sponsored retirement plan (i.e., 401K, 403B, etc).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
21) I am motivated to manage my finances.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22) I am motivated to save for my future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23) I am motivated to reduce my spending.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24) I am motivated to increase my savings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25) I am motivated to determine how much to spend based on my income.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26)	I am motivated to save in case of an emergency.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27)	I am motivated to use my credit cards less frequently.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28)	I am motivated to control my debt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29)	I am motivated to make a plan for repaying my debt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30)	I am motivated to make a plan for saving for the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31)	I am motivated to understand how to invest my money.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32)	I am motivated to manage my investments.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33)	I am motivated to save for retirement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34)	I am motivated to understand how to invest in the stock market.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35)	I am motivated to protect myself against investment fraud.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36)	I am motivated to manage my employer sponsored retirement plan (i.e., 401K, 403B, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Instructions: For the next set of questions, which are based on your financial knowledge and experiences, please choose the best answer:

Topic 1

37)

The best measure of your financial health is

- Your annual income
- Your assets
- Your available credit
- Your net worth

38)

Which of the following is NOT an asset?

- Cash on hand
- A credit card
- The market value of your automobile
- The money you have in a checking account

39)

Which of the following is a liability?

- A student loan
- A credit card

- The market value of your automobile
- The money you have in a checking account

Topic 2

40)

It's important to start saving regularly early in life because

- You earn more when you're younger
- Money invested well grows over time
- Saving needs to become a habit
- b & c

Topic 3

41)

You paid \$8,000 for a used car and financed it for 4 years. At the end of the four years, you total up your auto loan payments and find that you paid a total of \$10,500. You find that you also paid \$300 to maintain the car, \$2,000 for insurance and \$1,500 for repairs. What was the total cost of credit for the car purchase?

- \$2,500
- \$14,300
- \$11,800
- \$3,500

Topic 4

42)

Which is NOT a way to track your spending?

- Saving your receipts
- Balancing your checkbook
- Writing down everything you spend
- Entering everything you spend on an electronic device

43)

Which expense would be categorized as a periodic expense?

- Birthday presents
- Utility bills
- Credit card payments
- Rent

44)

Which expense would be categorized as a fixed expense?

- Birthday presents
- Utility bills
- Credit card payments
- Rent

Topic 5

45)

Which of the following would NOT be included in an emergency fund?

- Three month's living expenses
- Savings for purchasing new tires for your auto
- Retirement funds
- Savings for getting through a period of unemployment

46)

Which type of financial product is appropriate for savings for short term financial goals?

- A savings account
- A mutual fund
- Stocks
- A 401(k)

47)

A liquid asset is

- One that cannot be frozen
- One that can be rolled over
- One that can readily be converted to cash
- One that cannot be taxed

Continue ONLY when finished. You will be unable to return or change your answers.

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Topic 6

48)

An example of a tax sheltered investment in which your earnings grow tax free is a

- Stock
- Traditional IRA
- Certificate of Deposit
- Roth IRA

49)

Which of the following is a tax-deferred investment?

- Certificate of Deposit
- Roth IRA
- Traditional 401(k) plan investment
- Stock

50)

Which of the following is generally true?

- The lower the risk of an investment, the greater the opportunity for return.
- Risk and return have an inverse relationship.
- Risk and return are not related.
- The higher the risk of an investment, the greater the opportunity for return.

Topic 7

51)

A fraud scheme that relies on trust generated by association through group membership is

- Pyramid scheme
- Ponzi scheme
- Affinity fraud
- Pump and dump

52)

Which regulatory agency is NOT charged with investment oversight?

- FINRA
- HUD
- SEC
- FDIC

53)

Who would NOT need to be contacted if you thought you were the victim of investment fraud?

- Local police
- SEC
- FINRA
- Federal Reserve

Continue ONLY when finished. You will be unable to return or change your answers

Please respond yes or no to the following questions which describe your *financial experiences*:

Have you ever...

	no	yes
54) Taken out a loan for student education?	<input type="radio"/>	<input type="radio"/>
55) Taken out an auto loan?	<input type="radio"/>	<input type="radio"/>
56) Taken out a home equity loan?	<input type="radio"/>	<input type="radio"/>
57) Gotten (or refinanced) a mortgage?	<input type="radio"/>	<input type="radio"/>
58) Installment loan?	<input type="radio"/>	<input type="radio"/>

Have you ever...

	no	yes
59) Gotten a short-term "payday" or "salary advance" loan?	<input type="radio"/>	<input type="radio"/>
60) Gotten a "refund anticipation loan" to accelerate the receipt of your taxes?	<input type="radio"/>	<input type="radio"/>
61) Gotten an auto title loan?	<input type="radio"/>	<input type="radio"/>
62) Used a pawn shop	<input type="radio"/>	<input type="radio"/>
63) Bought goods on a lay-away plan?	<input type="radio"/>	<input type="radio"/>
64) Bought goods through a rent-to-own seller?	<input type="radio"/>	<input type="radio"/>

Have you ever...

	no	yes
65) Opened a checking or debit card account?	<input type="radio"/>	<input type="radio"/>
66) Opened a savings account or bought a CD?	<input type="radio"/>	<input type="radio"/>
67) Bought a savings bond or other bonds?	<input type="radio"/>	<input type="radio"/>
68) Invested in mutual funds?	<input type="radio"/>	<input type="radio"/>
69) Invested in individual stocks?	<input type="radio"/>	<input type="radio"/>

70)

In the last 12 months, which of the following describes your use of credit cards?

- I don't have any credit cards or did not use them.
- In some months, I ran an outstanding balance and paid finance charges.
- In some months, I paid the minimum payment only.

- In some months, I was charged a late charge for late payments.
- In some months, I was charged an over the limit charge for charging more than my credit limit.
- In some months, I used the cards for a cash advance.
- My account was closed down by the credit card company due to account mishandling.
- My account was closed down by the credit card company due to lack of use.
- I always paid my credit cards in full.

71)

How many credit cards do you have in your name? (Give number)

72)

Which of the following classes did you have in high school? (Check ALL that apply)

- An entire course in personal money management or personal finance.
- A portion of a course where at least a week was focused on personal money management or personal finance.
- An entire course in economics.
- A portion of a course where at least a week was focused on economics.
- A course in which we played a stock market game.

73)

Which of the following classes have you had in college? (Check ALL that apply)

- A semester-length course in personal money management or personal finance
- Coverage of money management or personal finance (including part of freshman orientation)
- Economics
- Finance
- Accounting

74)

Who prepares your income taxes?

- I do it myself by hand
- I do it myself using a computer program
- A tax preparer
- My parents

75)

I regard my income as a student (check ALL that apply)

- As low, but normal because college students generally have very little money while attending college.
- As low, but a temporary, bearable situation because I realize the opportunity to earn more money will come after I graduate from college.
- As low, but tolerable because I know earning a college degree will increase my future income prospects.
- As sufficient.

76)

I have used the following methods to seek out information on personal finances (check ALL that apply)

- Information seminar
- Information pamphlet/booklet
- Newspaper
- Radio
- Television
- Video
- Web pages/Internet

77)

If you were in need of information on personal finances, how would you MOST like to receive this information? (check only ONE)

- At a campus workshop/seminar
- In a formal college course
- In a packet of printed materials (i.e., pamphlets and handouts)
- On the Internet
- In one-on-one discussion with a financial professional

78)

Who would you MOST like to receive information on personal finances from? (check ALL that apply)

- At a campus workshop/seminar
- In a formal college course
- In a packet of printed materials (i.e., pamphlets and handouts)
- On the Internet
- In one-on-one discussion with a financial professional

79)

In the last few years, where or from whom did you find the most useful information about personal finances? (check ALL that apply)

- Parents
- Friends
- High school or college course
- Internet
- Financial institutions
- Non-profit organizations or businesses
- Books, magazines and newspapers
- TV and radio
- Have not gone to find information

80)

Thinking about your past experiences with personal finances, good or bad, please describe what impact they had on your subsequent experiences. (check only ONE)

- Impacted my financial experiences in a positive way.
- Did not impact my financial experiences in a positive way.
- Had no impact on my financial experiences.
- I did not consider how my past experiences might be related to future experiences.

81)

What do you feel is the level of your financial stress today?

- 1 Overwhelming stress
- 2
- 3
- 4 High stress
- 5
- 6
- 7 Low stress
- 8
- 9
- 10 No stress at all

82)

How satisfied are you with your present financial situation?

- 1 Complete dissatisfaction
- 2

- 3
- 4 Somewhat dissatisfied
- 5
- 6
- 7 Somewhat satisfied
- 8
- 9
- 10 Complete satisfaction

83)

How do you feel about your current financial condition?

- 1 Feel overwhelmed
- 2
- 3
- 4 Sometimes feel worried
- 5
- 6
- 7 Not worried
- 8
- 9
- 10 Feel comfortable

84)

How often do you worry about being able to meet normal monthly living expenses?

- 1 All the time
- 2
- 3
- 4 Sometimes
- 5
- 6
- 7 Rarely
- 8

- 9
- 10 Never

85)

How confident are you that you could find the money to pay for a financial emergency that costs about \$100?

- 1 No confidence
- 2
- 3
- 4 Little confidence
- 5
- 6
- 7 Some confidence
- 8
- 9
- 10 High confidence

86)

How confident are you that you could find the money to pay for a financial emergency that costs about \$300?

- 1 No confidence
- 2
- 3
- 4 Little confidence
- 5
- 6
- 7 Some confidence
- 8
- 9
- 10 High confidence

87)

How confident are you that you could find the money to pay for a financial emergency that costs about \$500?

- 1 No confidence
- 2
- 3
- 4 Little confidence

- 5
- 6
- 7 Some confidence
- 8
- 9
- 10 High confidence

88)

How confident are you that you could find the money to pay for a financial emergency that costs about \$1000?

- 1 No confidence
- 2
- 3
- 4 Little confidence
- 5
- 6
- 7 Some confidence
- 8
- 9
- 10 High confidence

89)

How often does this happen to you? You want to go out and eat, go to a movie or do something else and don't go because you can't afford to?

- 1 All the time
- 2
- 3
- 4 Sometimes
- 5
- 6
- 7 Rarely
- 8
- 9
- 10 Never

90)

How often do you find yourself just getting by and living paycheck to paycheck?

- 1 All the time
- 2
- 3
- 4 Sometimes
- 5
- 6
- 7 Rarely
- 8
- 9
- 10 Never

91)

How stressed do you feel about your personal finances in general?

- 1 Overwhelming stress
- 2
- 3
- 4 High stress
- 5
- 6
- 7 Low stress
- 8
- 9
- 10 No stress at all

Continue ONLY when finished. You will be unable to return or change your answers.

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Instructions: The next set of questions ask you about your background. Please select the best response for each question.

92)

What is your sex?

- Female
- Male
- Prefer not to respond

93)

How old are you? (in years)

94)

Which of the following best describes your current place of residence?

- Residence hall/dorm
- Apartment, house, condo (with friends but not with parents)
- Apartment, house, condo (alone, not with friends or parents)
- Fraternity/Sorority house
- Live with parents
- Other (please specify)

95)

In what category is your primary major?

- Agriculture
- Allied Medical & Health (e.g., Nursing, Pharmacy)
- Art & Design (e.g., Fine Arts, Music)
- Business (e.g., Accounting, Management)
- Education
- Engineering
- Information Technology/Computer Science
- Liberal Arts (e.g., Psychology, Sociology, Humanities)
- Mathematics
- Sciences (e.g., Biology, Chemistry)
- Veterinary Medicine
- Other (please specify)

96)

What is your racial/ethnic background? (check ALL that apply)

- Asian/Pacific Islander
- Black/African American
- Caucasian
- Native American/Alaskan Native

Other (please specify)

97)

Are you Hispanic?

- Yes
 No

98)

What type of area did you grow up in?

- Suburban
 Rural
 Urban
 It varied, I moved a lot
 Do not know

99)

With whom did you live while growing up?

- Two parents/guardians
 One parent/guardian
 Other (please specify)

100)

In what state did you attend high school?
Enter name of state

101)

In what state do you attend college?

- Florida
 Kansas
 Kentucky
 Mississippi
 Tennessee
 North Carolina
 Other (please specify)

CLICK TO SUBMIT INFORMATION FOR KINDLE RAFFLE AND/OR END SURVEY

Continue ONLY when finished. You will be unable to return or change your answers.

Figure B1. Survey Instrument. Adapted from “Online Investor Education for College Students – Control Group Study,” by C.L. Bird, 2010, North Carolina State University. Copyright 2010 by North Carolina State University. Reprinted with permission.

Appendix C

Figure C1. IRB Consent Form

North Carolina State University
INFORMED CONSENT FORM for RESEARCH

Study Name: Investor Education for College Students - Control Group Study

Principal Investigator: Dr. Carolyn Bird

What are some general things you should know about research studies?

You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of research studies is to gain a better understanding of a certain topic or issue. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

What is the purpose of this study?

This research project is intended to look at personal financial management and investor knowledge of college students. We are investigating young adult college students' motivation and skills to save, invest and manage their money wisely toward a lifetime of financial success.

What will happen if you take part in the study?

If you agree to participate in this study, you will be asked to fill out a survey. The survey will inquire about your knowledge and attitudes in personal financial management and investment procedures. The survey will be made available on the internet through an NCSU URL, and should take no longer than 40 minutes to complete.

Risks

You may feel uncomfortable sharing information about your personal finances and investment management procedures. However, please rest assured that your responses will be kept completely confidential. Your name will not be associated with your survey responses. Therefore, your responses are completely anonymous.

Benefits

A benefit to you may be increased awareness of your personal finance and investment management knowledge and attitudes.

This research will assist us in designing information, resources, and a curriculum to provide young adult college students with knowledge and skills in personal finance and investing.

Confidentiality

The information in the study records will be kept confidential to the full extent allowed by law. Data will be stored securely on NCSU's computer network. No reference will be made in oral or written reports which could link you personally to the study.

Compensation

You will not receive any monetary compensation or course credit for participating in this survey. One survey participant will be drawn at random to receive a Kindle wireless electronic reading device.

At the end of this survey you will be asked if you would like to participate in a random drawing for a Kindle wireless electronic reader. You will need to click on a separate link to enter your name and contact information to be included in the drawing. We are using a separate link to ensure that your contact information is not connected to your survey responses.

No other compensation is available or offered for participating in this study.

What if you have questions about this study?

If you have questions at any time about the study or the procedures, you may contact the researcher, Dr. Carolyn Bird, at carolyn_bird@ncsu.edu. (919)573-7293.

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus (919/515-4514).

Consent To Participate

"I have read and understand the above information. I have received a copy of this form. I agree to participate in this study with the understanding that I may choose not to participate

or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled.”

Subject's signature _____ Date

Investigator's signature _____ Date

Figure C2. IRB Request for Exemption Approval

North Carolina State University is a land-grant
university and a constituent institution of the
University of North Carolina

Office of Research and Innovation
Division of Research Administration

NC STATE UNIVERSITY

Campus Box 7514
Raleigh, North Carolina 27695-7514

919.515.8754 (phone)
919.515.7721 (fax)

From: Jennifer Ofstein, IRB Coordinator
North Carolina State University
Institutional Review Board

Date: June 5, 2014

Title: Dissertation Research, Examining Self-efficacy and Financial Behaviors as
Predictors of Undergraduate College Students' Financial Literacy

IRB#: 4039

Dear Donna Hucul,

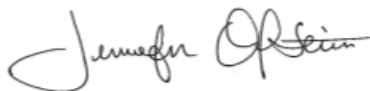
The research proposal named above has received administrative review and has been approved as exempt from the policy as outlined in the Code of Federal Regulations (Exemption: 46.101. b.4). Provided that the only participation of the subjects is as described in the proposal narrative, this project is exempt from further review. This approval does not expire, but any changes must be approved by the IRB prior to implementation.

NOTE:

1. This committee complies with requirements found in Title 45 part 46 of The Code of Federal Regulations. For NCSU projects, the Assurance Number is: FWA00003429.
2. Any changes to the research must be submitted and approved by the IRB prior to implementation.
3. If any unanticipated problems occur, they must be reported to the IRB office within 5 business days.

Please forward a copy of this letter to your faculty sponsor, if applicable.
Thank you.

Sincerely,



Jennifer Ofstein
NC State IRB

Figure C3. Judge's Rating Form for the 17-item Financial Literacy Test

Financial Literacy Test for the Study, "Investment and Financial Experiences of College Students"

Dr. Carolyn L. Bird, PhD., AFC
 Donna Hucul, Doctoral student, College of Education
 North Carolina State University

Reviewer _____

Date _____

Please carefully read each of the 17 financial literacy questions below which are organized by topic. Then use the scale below to indicate how well each item serves as a measure of financial literacy for the given topic. Judge the test items solely on the basis of match between the question's content and the content of the topic area. The four point rating scale is as follows:

Question/Topic Relevancy Scale

1	2	3	4
<i>not relevant</i>	<i>somewhat relevant</i>	<i>quite relevant</i>	<i>very relevant</i>

Relevance Rating (1-4)

TOPIC 1 – MEASURING FINANCIAL HEALTH

- _____ 1) **The best measure of your financial health is**
- Your annual income
 - Your assets
 - Your available credit
 - Your net worth
- _____ 2) **Which of the following is NOT an asset?**
- Cash on hand
 - A credit card
 - The market value of your automobile
 - The money you have in a checking account
- _____ 3) **Which of the following is a liability?**
- A student loan
 - A credit card
 - The market value of your automobile
 - The money you have in a checking account

TOPIC 2 – SAVING HABITS

- _____ 4) **It's important to start saving regularly early in life because**
- You earn more when you're younger
 - Money invested well grows over time
 - Saving needs to become a habit
 - b & c

Question/Topic Relevancy Scale

1	2	3	4
<i>not relevant</i>	<i>somewhat relevant</i>	<i>quite relevant</i>	<i>very relevant</i>

**Relevance
Rating
(1-4)**

TOPIC 3 – DEBT

- _____ 5) You paid \$8,000 for a used car and financed it for 4 years. At the end of the four years, you total up your auto loan payments and find that you paid a total of \$10,500. You find that you also paid \$300 to maintain the car, \$2,000 for insurance and \$1,500 for repairs. What was the total cost of credit for the car purchase?
- \$2,500
 - \$14,300
 - \$11,800
 - \$3,500

TOPIC 4 – SPENDING AND EXPENSES

- _____ 6) Which is NOT a way to track your spending?
- Saving your receipts
 - Balancing your checkbook
 - Writing down everything you spend
 - Entering everything you spend on an electronic device
- _____ 7) Which expense would be categorized as a periodic expense?
- Birthday presents
 - Utility bills
 - Credit card payments
 - Rent
- _____ 8) Which expense would be categorized as a fixed expense?
- Birthday presents
 - Utility bills
 - Credit card payments
 - Rent

Question/Topic Relevancy Scale

1	2	3	4
<i>not relevant</i>	<i>somewhat relevant</i>	<i>quite relevant</i>	<i>very relevant</i>

**Relevance
Rating**

(1-4)

TOPIC 5 – IMPORTANCE OF LIQUID FUNDS

- _____ 9) Which of the following would NOT be included in an emergency fund?
- Three month's living expenses
 - Savings for purchasing new tires for your auto
 - Retirement funds
 - Savings for getting through a period of unemployment
- _____ 10) Which type of financial product is appropriate for savings for short term financial goals?
- A savings account
 - A mutual fund
 - Stocks
 - A 401(k)
- _____ 11) A liquid asset is
- One that cannot be frozen
 - One that can be rolled over
 - One that can readily be converted to cash
 - One that cannot be taxed

TOPIC 6 – 401K/RETIREMENT SAVINGS

- _____ 12) An example of a tax sheltered investment in which your earnings grow tax free is a
- Stock
 - Traditional IRA
 - Certificate of Deposit
 - Roth IRA
- _____ 13) Which of the following is a tax-deferred investment?
- Certificate of Deposit
 - Roth IRA
 - Traditional 401(k) plan investment
 - Stock
- _____ 14) Which of the following is generally true?
- The lower the risk of an investment, the greater the opportunity for return.
 - Risk and return have an inverse relationship.
 - Risk and return are not related.
 - The higher the risk of an investment, the greater the opportunity for return.

Question/Topic Relevancy Scale

1	2	3	4
<i>not relevant</i>	<i>somewhat relevant</i>	<i>quite relevant</i>	<i>very relevant</i>

Relevance Rating (1-4)

TOPIC 7 – FINANCIAL REGULATION/FRAUD

___ 15) A fraud scheme that relies on trust generated by association through group membership is

- Pyramid scheme
- Ponzi scheme
- Affinity fraud
- Pump and dump

___ 16) Which regulatory agency is NOT charged with investment oversight?

- FINRA
- HUD
- SEC
- FDIC

___ 17) Who would NOT need to be contacted if you thought you were the victim of investment fraud?

- Local police
- SEC
- FINRA
- Federal Reserve

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Appendix D

Figure D1. Personal Financial Wellness (PFW) Scale ©

Directions: Circle or check the responses that are *most appropriate* for your situation.

1. What do you feel is the *level* of your *financial stress today*?

1	2	3	4	5	6	7	8	9	10
Overwhelming Stress		High Stress			Low Stress		No Stress at All		

2. On the stair steps below, mark (with a circle) how *satisfied* you are with your *present financial situation*. The “1” at the bottom of the steps represents complete dissatisfaction. The “10” at the top of the stair steps represents complete satisfaction. The more dissatisfied you are, the lower the number you should circle. The more satisfied you are, the higher the number you should circle.

Satisfied

10

9

8

7

6

5

4

3

2

1

Dissatisfied

3. How do you feel about your *current financial situation*?

1	2	3	4	5	6	7	8	9	10
Feel Overwhelmed		Sometimes Feel Worried			Not Worried		Feel Comfortable		

4. How often do you worry about being *able to meet* normal monthly living expenses?

1	2	3	4	5	6	7	8	9	10
Worry All the Time		Sometimes Worry			Rarely Worry		Never Worry		

5. How confident are you that you could find the money to pay for a *financial emergency* that costs about **\$1,000**?

1	2	3	4	5	6	7	8	9	10
No Confidence		Little Confidence			Some Confidence		High Confidence		

6. How often does this happen to you? You want to go out to eat, go to a movie or do something else and *don't go because you can't afford to*?

1	2	3	4	5	6	7	8	9	10
All the time		Sometimes			Rarely		Never		

7. How frequently do you find yourself just getting by financially and living *paycheck to paycheck*?

1	2	3	4	5	6	7	8	9	10
All the time		Sometimes			Rarely		Never		

8. How *stressed* do you feel about your personal finances *in general*?

1	2	3	4	5	6	7	8	9	10
Overwhelming Stress		High Stress			Low Stress		No Stress at All		

Figure D1. Personal Financial Wellness Scale. Reprinted from “Incharge Financial Distress/Financial Well-Being Scale: Development, Administration and Score Interpretation,” by A.D Prawitz, E. T. Garman, B. Sorhaindo, B. O’Neill, J. Kim, and P. Dretea, 2006, Retrieved from <http://www.pfeef.org/scale/well-being.html>. Copyright 2006-2012 by the Personal Finance Employee Education Foundation. Reprinted with permission.

Figure D2. Normative Descriptive Terminology for Interpreting PFW Scores

Score	Descriptive terminology
1.0	Overwhelming financial distress/lowest financial well-being
2.0	Extremely high financial distress/extremely low financial well-being
3.0	Very high financial distress/very poor financial well-being
4.0	High financial distress/poor financial well-being
5.0	Average financial distress/average financial well-being
6.0	Moderate financial distress/moderate financial well-being
7.0	Low financial distress/good financial well-being
8.0	Very low financial distress/very good financial well-being
9.0	Extremely low financial distress/extremely high financial well-being
10.0	No financial distress/highest financial well-being

Figure D2. Personal Financial Wellness Scale. Reprinted from “Incharge Financial Distress/Financial Well-Being Scale: Development, Administration and Score Interpretation,” by A.D Prawitz, E. T. Garman, B. Sorhaindo, B. O’Neill, J. Kim, and P. Drentea, 2006, Retrieved from <http://www.pfeef.org/scale/well-being.html>. Copyright 2006-2012 by the Personal Finance Employee Education Foundation. Reprinted with permission.

Figure D3. Monitor Classification Legend

Classification	Intraclass Correlation	Attenuation of Process Signal	Probability of Warning, Test 1
First Class	0.80-1.00	Less than 11%	0.99 - 1.0
Second Class	0.50-0.80	11% - 29%	0.88 - 0.99
Third Class	0.20-0.50	29% - 55%	0.40 - 0.88
Fourth Class	0.00-0.20	More than 55%	0.03 - 0.40

Figure D3. Monitor Classification Legend for the ICC Coefficient. Adapted from “JMP® 11 Quality and Process Methods (p 157), by SAS Institute Inc., 2013, Cary, NC: SAS Institute Inc. Copyright 2013 by the SAS Institute, Inc.

Table D1. Undergraduate College Students' Self-Confidence Ratings toward their Financial Abilities

	Mean	SD	SE	95% CI
Manage finances	3.98	0.85	0.071	[3.84, 4.12]
Save for the future	4.03	0.87	0.072	[3.89, 4.17]
Reduce spending	3.92	0.82	0.068	[3.79, 4.06]
Increase savings	3.95	0.83	0.069	[3.82, 4.09]
Determine spending based on my income	4.00	0.84	0.070	[3.86, 4.14]
Save for an emergency	4.02	0.85	0.071	[3.88, 4.16]
Use credit cards less often	4.21	0.85	0.071	[4.07, 4.35]
Control debt	4.09	0.82	0.068	[3.96, 4.22]
Repay debt	4.09	0.82	0.068	[3.96, 4.22]
Make a plan for future savings	4.11	0.72	0.060	[3.99, 4.23]
Understand how to invest money	3.08	1.22	0.102	[2.88, 3.28]
Manage investments	3.17	1.14	0.095	[2.99, 3.36]
Save for retirement	3.54	1.10	0.092	[3.36, 3.72]
Understand how to invest in the stock market	2.42	1.20	0.100	[2.23, 2.62]
Recognize and investment scheme	3.05	1.48	0.200	[2.66, 3.45]
Protect myself against investment fraud	3.16	1.29	0.107	[2.95, 3.37]
Manage my 401K/Retirement account	3.41	1.20	0.100	[3.21, 3.61]

Note. n = 144. Means were based on 5-point Likert scale responses where 1 = strongly disagree; 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree.

Table D2. Undergraduate College Students Motivation Ratings toward their Financial Abilities

	Mean	SD	SE	95% CI
Manage finances	4.25	0.74	0.062	[4.13, 4.37]
Save for the future	4.31	0.85	0.071	[4.17, 4.44]
Reduce spending	4.02	1.02	0.085	[3.85, 4.19]
Increase savings	4.30	0.80	0.067	[4.16, 4.43]
Determine spending based on my income	4.24	0.80	0.067	[4.11, 4.37]
Save for an emergency	4.12	0.90	0.075	[3.97, 4.27]
Use credit cards less often	3.87	1.05	0.087	[3.70, 4.04]
Control debt	4.31	0.80	0.066	[4.18, 4.44]
Repay debt	4.10	0.91	0.076	[3.96, 4.25]
Make a plan for future savings	4.24	0.83	0.069	[4.10, 4.37]
Understand how to invest money	4.04	0.90	0.075	[3.90, 4.19]
Manage investments	3.99	0.93	0.077	[3.84, 4.14]
Save for retirement	4.02	1.04	0.087	[3.85, 4.19]
Understand how to invest in the stock market	3.76	1.12	0.093	[3.58, 3.95]
Protect myself against investment fraud	4.10	0.92	0.077	[3.95, 4.25]
Manage my 401K/Retirement account	4.02	0.93	0.077	[3.87, 4.17]

Note. $n = 144$. Means were based on 5-point Likert scale responses where 1 = strongly disagree; 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree.

Table D3. Item Difficulty Indices of Financial Literacy Test Items

Survey item no.	Number of correct responses	Percent of correct responses
37	61	0.41
38	111	0.74
39	76	0.51
40	131	0.87
41	55	0.37
42	35	0.23
43	111	0.74
44	121	0.81
45	93	0.62
46	110	0.73
47	121	0.81
48	57	0.38
49	77	0.51
50	80	0.53
51	47	0.31
52	60	0.40
53	67	0.45

Note. n=144

Table D4. Item Discrimination Indices of Financial Literacy Test Items

Survey item no.	Discrimination computation	Discrimination index
37	$d = (20-4)/36$	0.44
38	$d = (35-13)/36$	0.61
39	$d = (29-9)/36$	0.56
40	$d = (36-22)/36$	0.39
41	$d = (27-7)/36$	0.56
42	$d = (16-3)/36$	0.36
43	$d = (29-20)/36$	0.25
44	$d = (34-19)/36$	0.42
45	$d = (31-13)/36$	0.50
46	$d = (30-21)/36$	0.25
47	$d = (35-17)/36$	0.50
48	$d = (23-7)/36$	0.44
49	$d = (27-9)/36$	0.50
50	$d = (33-5)/36$	0.78
51	$d = (17-11)/36$	0.17
52	$d = (22-4)/36$	0.50
53	$d = (24-10)/36$	0.39

Note. n=144. Using frequency distribution of financial literacy test score, one quartile included of 36 participants.

Table D5. Content Validity Coefficients of Inter-Rater Consensus by a Panel of Expert Judges

	Content Validity = D / (A+B+C+D)	Validity Coefficient
Judge 1	9 / (0 + 1 + 7 + 9)	0.53
Judge 2	5 / (0 + 9 + 3 + 5)	0.29
Judge 3	7 / (3 + 1 + 6 + 7)	0.41
Judge 4	5 / (0 + 8 + 4 + 5)	0.29
Judge 5	10 / (1 + 1 + 5 + 10)	0.59
Panel Average		0.42

Appendix E Inter correlations – Motivation.

INTER CORRELATIONS - MOTIVATION

Bivariate Correlations	MOTIVATION															
	Manage Finances	Save For Future	Reduce Spending	Increase Savings	Determine Spend Per Income	Save For Emergency	Use CC less	Control Debt	Repay Debt	Plan Future Savings	Understand How To Invest Money	Manage Investments	Save For Retirement	Understand How To Invest In Stock Market	Protect Investment Fraud	Manage 401K
Manage Finances	1.00	0.78	0.62	0.70	0.71	0.68	0.43	0.59	0.56	0.63	0.56	0.56	0.63	0.43	0.54	0.64
Save For Future	0.78	1.00	0.60	0.78	0.70	0.74	0.41	0.54	0.48	0.70	0.55	0.53	0.65	0.43	0.52	0.58
Reduce Spending	0.62	0.60	1.00	0.67	0.57	0.52	0.46	0.40	0.49	0.44	0.44	0.40	0.47	0.46	0.42	0.48
Increase Savings	0.70	0.78	0.67	1.00	0.67	0.69	0.43	0.61	0.53	0.59	0.48	0.44	0.54	0.42	0.49	0.49
Determine Spend Per Income	0.71	0.70	0.57	0.67	1.00	0.73	0.48	0.56	0.52	0.62	0.57	0.55	0.65	0.51	0.56	0.57
Save For Emergency	0.68	0.74	0.52	0.69	0.73	1.00	0.53	0.56	0.55	0.67	0.68	0.64	0.63	0.57	0.55	0.58
Use CC less	0.43	0.41	0.46	0.43	0.48	0.53	1.00	0.55	0.68	0.54	0.47	0.47	0.48	0.48	0.45	0.44
Control Debt	0.59	0.54	0.40	0.61	0.56	0.56	0.55	1.00	0.70	0.57	0.51	0.47	0.52	0.38	0.62	0.54
Repay Debt	0.56	0.48	0.49	0.53	0.52	0.55	0.68	0.70	1.00	0.65	0.49	0.46	0.58	0.35	0.49	0.52
Plan Future Savings	0.63	0.70	0.44	0.59	0.62	0.67	0.54	0.57	0.65	1.00	0.58	0.56	0.67	0.49	0.49	0.55
Investing Know How	0.56	0.55	0.44	0.48	0.57	0.68	0.47	0.51	0.49	0.58	1.00	0.89	0.62	0.75	0.66	0.70
Manage Investments	0.56	0.53	0.40	0.44	0.55	0.64	0.47	0.47	0.46	0.56	0.89	1.00	0.66	0.73	0.68	0.77
Save For Retirement	0.63	0.65	0.47	0.54	0.65	0.63	0.48	0.52	0.58	0.67	0.62	0.66	1.00	0.55	0.65	0.77
Invest In Stock Market	0.43	0.43	0.46	0.42	0.51	0.57	0.48	0.38	0.35	0.49	0.75	0.73	0.55	1.00	0.66	0.64
Protect Investment Fraud	0.54	0.52	0.42	0.49	0.56	0.55	0.45	0.52	0.49	0.49	0.66	0.68	0.65	0.66	1.00	0.81
Manage 401K	0.64	0.58	0.48	0.49	0.57	0.58	0.44	0.54	0.52	0.55	0.70	0.77	0.77	0.64	0.81	1.00

leave drop leave drop drop leave leave leave drop leave drop drop drop leave drop leave

leave 8

drop 8

due to high intercorrelations

**The correlations are estimated by Pairwise method.

Appendix E Inter correlations Self-Confidence

INTER CORRELATIONS - SELF CONFIDENCE

Bivariate Correlations		SELF CONFIDENCE															
Variables	Manage Finances	Save For Future	Reduce Spending	Increase Savings	Determine Spend Per Income	Save For Emergency	Use CC less	Control Debt	Repay Debt	Plan Future Savings	Understand How To Invest Money	Manage Investments	Save For Retirement	Understand How To Invest In Stock Market	Recognize Investment Scheme	Protect Investment Fraud	Manage 401K
Manage Finances	1.00	0.59	0.46	0.43	0.58	0.37	0.20	0.39	0.41	0.44	0.43	0.46	0.55	0.43	0.42	0.42	0.56
Save For Future	0.59	1.00	0.50	0.65	0.54	0.54	0.27	0.51	0.52	0.70	0.39	0.41	0.64	0.31	0.21	0.23	0.41
Reduce Spending	0.46	0.50	1.00	0.47	0.45	0.39	0.43	0.43	0.41	0.42	0.35	0.34	0.39	0.21	0.28	0.25	0.33
Increase Savings	0.43	0.65	0.47	1.00	0.45	0.58	0.32	0.45	0.39	0.55	0.37	0.37	0.45	0.30	0.27	0.19	0.41
Determine Spend Per Income	0.58	0.54	0.45	0.45	1.00	0.46	0.25	0.50	0.45	0.48	0.45	0.47	0.46	0.35	0.40	0.42	0.44
Save For Emergency	0.37	0.54	0.39	0.58	0.46	1.00	0.37	0.43	0.45	0.59	0.37	0.39	0.41	0.25	0.28	0.24	0.32
Use CC less	0.20	0.27	0.43	0.32	0.25	0.37	1.00	0.42	0.35	0.31	0.13	0.15	0.14	0.13	0.05	0.02	0.09
Control Debt	0.39	0.51	0.43	0.45	0.50	0.43	0.42	1.00	0.69	0.52	0.29	0.36	0.33	0.22	0.23	0.18	0.31
Repay Debt	0.41	0.52	0.41	0.39	0.45	0.45	0.35	0.69	1.00	0.65	0.33	0.35	0.38	0.22	0.24	0.19	0.37
Plan Future Savings	0.44	0.70	0.42	0.55	0.48	0.59	0.31	0.52	0.65	1.00	0.45	0.46	0.57	0.27	0.25	0.20	0.42
Investing Know How	0.43	0.39	0.35	0.37	0.45	0.37	0.13	0.29	0.33	0.45	1.00	0.86	0.54	0.66	0.62	0.61	0.59
Manage Investments	0.46	0.41	0.34	0.37	0.47	0.39	0.15	0.36	0.35	0.46	0.86	1.00	0.60	0.67	0.61	0.58	0.59
Save For Retirement	0.55	0.64	0.39	0.45	0.46	0.41	0.14	0.33	0.38	0.57	0.54	0.60	1.00	0.52	0.47	0.48	0.63
Invest In Stock Market	0.43	0.31	0.21	0.30	0.35	0.25	0.13	0.22	0.22	0.27	0.66	0.67	0.52	1.00	0.74	0.60	0.61
Recognize Investment Scheme	0.42	0.21	0.28	0.27	0.40	0.28	0.05	0.23	0.24	0.25	0.62	0.61	0.47	0.71	1.00	0.76	0.70
Protect Investment Fraud	0.42	0.23	0.25	0.19	0.42	0.24	0.02	0.18	0.19	0.20	0.61	0.58	0.48	0.60	0.76	1.00	0.67
Manage 401K	0.56	0.41	0.33	0.41	0.44	0.32	0.09	0.31	0.37	0.42	0.59	0.59	0.63	0.61	0.70	0.67	1.00

leave	drop	leave	leave	leave	leave	leave	drop	leave	drop	leave	drop	leave	drop	drop	drop	drop	drop
leave	9																
drop	8																

*The correlations are estimated by Pairwise method.

2 reasons:
 (1) item discrimination
 (2) not in motivation list