Walden University

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Tanya Noah

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Eric Riedel, Ph.D.

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2018

Abstract

Financial Literacy in Appalachian Kentucky with a National Comparison

by

Tanya Lynn Parton Noah

MS, Eastern Kentucky University, 2006

BS, Lincoln Memorial University, 2002

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Management

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Abstract

Financial literacy is a national problem; many studies confirmed that Americans have low levels of financial literacy. There is little to no research about financial literacy in Appalachia, and the level of financial literacy was unknown for Appalachian Kentucky. There is a problem deserving attention which can be seen by examination of the 3 key financial indicators. Many researchers found the Appalachian Kentucky region deficient regarding poverty rates, unemployment rates, and personal income rates. The purpose of this study was to develop a baseline level of financial literacy of Appalachian Kentuckians and to compare it to national levels. Becker's theory of human capital served as the theoretical framework of this study. The research questions asked the difference between the levels of financial literacy of Appalachian Kentuckians and Americans. A survey design was used to collect data from residents in an Appalachian Kentucky county (n = 35) that was mathematically average based on the key financial indicators as reported by the Appalachian Regional Commission. The national financial literacy rate was derived from the National Financial Capability Study. A one-sample t test indicated that the financial literacy level of Appalachian Kentuckians is less than the national level. Multiple linear regression analysis indicated that financial literacy levels can be predicted either by personal income or poverty. This study offers positive social change by providing a baseline understanding of financial literacy in Appalachian Kentucky to draw more attention to the improvement needs in this area. Improving financial literacy has the potential to improve key financial indicators of the region, and thus, the lives of Appalachian Kentuckians.

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Dedication

This work is dedicated to my family. It is especially dedicated to my children, Callie and Thomas; my husband, Justin; and my parents, David and Becky. Their love, encouragement, faith in me, assistance, cooperation, and most importantly, their patience has helped me to succeed.

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Chapter 1: Introduction to the Study

Financial literacy is a national issue, and the state of financial literacy in Appalachian Kentucky was the focus of this study. There is a lack of adequate financial literacy in the population of the United States according to existing research (Financial Industry Regulatory Authority [FINRA] Investor Education Foundation, 2013; FINRA Investor Education Foundation, 2016a; Mandell, 2008; Organisation for Economic Co-operation and Development [OECD], 2014; Robb, 2014). In addition, there has been an ongoing concern with the financial state of the Appalachian Kentucky region dating back to the term of President Lyndon B. Johnson (Compion, et al., 2015; Douglas & Walker, 2012; Thorne, Tickamyer, & Thorne, 2004). Specific concerns were addressed in the research regarding the Appalachian region in relation to three key financial indicators: poverty, unemployment, and personal income (Deaton & Niman, 2012; Gebremariam, Gebremedhin, & Schaeffer, 2011; Perdue & Sanchagrin, 2016; Thorne et al., 2004). The state of financial literacy in the United States and the financial state of the Appalachian region warrant research to determine the financial literacy of the residents of Appalachian Kentucky. Efforts have been made to determine ways to improve the key financial indicators of this region. This study determined there may be opportunities to improve the key financial indicators by focusing on the financial literacy in the region. Understanding how financial literacy interacts with these three key financial indicators provides the opportunity to invoke positive social change for a financially desperate region by providing direction for financial literacy efforts. In this chapter, I introduce the study by

discussing the background of the study, the problem statement, purpose of the study, research questions, and the theoretical foundation.

Background of the Study

Americans have a low level of financial literacy according to existing research (FINRA Investor Education Foundation, 2013, 2016a; Huston, 2012; Lusardi & Mitchell, 2014; Mandell, 2008; OECD, 2014; Robb, 2014). A recent study of 25,000 American adults indicated low financial literacy levels; specifically, only 14% of respondents correctly answered all the financial literacy questions on the survey (FINRA Investor Education Foundation, 2013). Lusardi and Mitchell (2014) indicated in their research that there was a positive association between financial literacy and socioeconomic status. This implies that, as levels of financial literacy increase, there is also an increase in socioeconomic status. Buckland, Fikkert, and Gonske (2013) completed a qualitative study that attempted to understand the financial habits of 13 poor Canadians. The study depicted both their struggles and successes with the diary method used to collect the data, and some relationships between full-time employment and healthy finances were described.

Appalachia has been described as one of the poorest regions in America (Deaton & Niman, 2012; Douglas & Walker, 2012; Partridge, Betz, & Lobao, 2012). Within the Appalachian region, Appalachian Kentucky was ranked at or near the bottom in terms of poverty, unemployment, and personal income (Appalachian Regional Commission, 2016a; Deaton & Niman, 2012; Douglas & Walker, 2012; Gebremariam et al., 2011; Partridge et al., 2012; Perdue & Sanchagrin, 2016). There has been little to no research

relating specifically to financial literacy in Appalachian Kentucky. The positive association between financial literacy and socioeconomic status demonstrated in the research of Lusardi and Mitchell (2014) and the poor economic state of Appalachian Kentucky indicates a need to understand the financial literacy levels in the Appalachian region. There has been additional research that focused on Appalachia and financial literacy individually.

Much of Appalachian Kentucky is made up of rural areas. Rohini, Monika, and Sudha (2015) analyzed major sources of financial knowledge for the people of the villages of the rural Kanyakumari district in India's Tamil Nadu State. They determined that there was a positive relationship between financial literacy and both education and income in this rural region (Rohini et al., 2015). Gebremariam et al. (2011) focused their research study on employment, income, and migration in the Appalachian region. Employment, migration, and median household income were found to be interdependent with one another and showed an association with the region (Gebremariam et al., 2011). O'Neill, Porter, Pankow, Schuchardt, & Johnson (2010) collected financial literacy data from farm households in the United States. The research was done in part to begin to understand rural farmers investing practices, retirement planning, and ability to attain benefits; there was also an interest in understanding the rural farmer's desire to learn from an online financial education program (O'Neill et al., 2010). The unique social, financial, and geographical challenges of rural areas indicate a need for a research focus to encourage residents and businesses to choose to remain in the Appalachian region (Gebremariam et al., 2011; Rohini et al., 2015).

Problem Statement

Appalachia remains one of the poorest regions in America (Deaton & Niman, 2012; Douglas & Walker, 2012; Partridge et al., 2012). A recent study of 25,000 American adults indicated low financial literacy levels; merely 14% correctly answered all financial literacy survey questions (FINRA Investor Education Foundation, 2013). The general problem is a national concern of low financial literacy levels (FINRA Investor Education Foundation, 2013; Huston, 2012; Lusardi & Mitchell, 2014). Studies focus on financial literacy and Appalachia's financial situation separately, yet a gap exists regarding Appalachia's financial literacy position (Buckland et al., 2013; Partridge et al., 2012). The specific problem to be studied is the lack of a measure of Appalachian Kentucky's financial literacy level in comparison to the nation. Financial literacy typically focuses on personal finances, yet financially literate employees can be more receptive to management decisions, including financial decisions (Lemmer & Sampson, 2015; Vitt, 2014). This study's results may have potential to impact financial literacy and management in Appalachian Kentucky.

Purpose of the Study

The purpose of this quantitative, nonexperimental study was to determine the level of financial literacy for residents of Appalachian Kentucky and compare it to that of the residents of the entire United States. The results of this study could present a foundation for an argument to improve financial literacy programs in Appalachian Kentucky to elicit social change. The baseline information produced from this study also have the potential to be used for further research.

It has been shown that Appalachian region loses its more educated residents in the search of better opportunities; improving financial literacy can help retain these residents, improving the employee pool for management (Gebremariam et al., 2011; Ludke & Obermiller, 2014). In making the comparison and demonstrating the baseline, this study may bring attention to the need for further understanding of the financial literacy needs for the Appalachian Kentucky area. In this way, this study has the potential to begin to help improve the key financial indicators of poverty, unemployment, and personal income in the Appalachian Kentucky area.

Research Question and Hypotheses

RQ1: What is the degree to which the levels of financial literacy between Appalachian Kentuckians and Americans differ?

$H_0$1: There is no significant difference between the mean level of financial literacy of Appalachian Kentuckians and the constant value representing the financial literacy level of Americans.

H_a1: There is a significant difference between the mean levels of financial literacy of Appalachian Kentuckians and the constant value representing the financial literacy level of Americans.

This first research question allowed for comparison of the levels of financial literacy between Appalachian Kentuckians and the entire United States. The financial literacy rate of Americans was obtained from existing data, and hence, was a constant. The hypothesis tested checked for a difference between the mean level of financial literacy for Appalachian Kentuckians and Americans. To do so, the mean was tested

according to its difference between a constant. The results also produced the necessary baseline financial literacy information of Appalachian Kentuckians.

RQ2: What is the relationship between the financial literacy level of Appalachian Kentuckians and the Appalachian Kentucky poverty, unemployment, and personal income rates?

$H_0$2: The Appalachian Kentucky financial literacy rate is not affected by the Appalachian Kentucky poverty, unemployment, or personal income rates.

H_a2: The Appalachian Kentucky financial literacy rate is affected by at least one of the variables Appalachian Kentucky poverty, unemployment, or personal income rates.

The purpose of this second research question is to determine whether a relationship exists between the financial literacy level of Appalachian Kentuckians and the three key financial indicators of focus in this study: poverty, unemployment, and personal income rates. Hence the dependent variable is the financial literacy level of Appalachian Kentuckians and the independent variables tested are the Appalachian Kentucky poverty rate, the Appalachian Kentucky unemployment rate, and the Appalachian Kentucky personal income rate.

Theoretical Foundation

The theory of Becker (1974) guides this study of financial literacy. Becker was one of the first researchers to indicate human capital as a necessary component of improving the economy (Badea & Rogojanu, 2012; Levine, 2008). Both Henager and Mauldin (2015) and Huston (2012) focused their studies of financial literacy theoretically

from a human capital stance. Improving financial literacy is an investment in human capital (Huston, 2012; Lusardi & Mitchell, 2014). In turn, defining financial literacy within the area of human capital might encourage an investment in financial literacy (Lusardi & Mitchell, 2014). An investment in the residents of the Appalachian Kentucky region is necessary to improve their financial literacy, and consequently, their financial well-being.

Human capital drives economic development (Badea & Rogojanu, 2012; Khan, Iqbal, & Rehman, 2016). Having an adequate level of financial literacy allows individuals to have the ability to make better financial decisions, to have a greater financial advantage, to better allocate their resources, and to be more employable (Agnew, Anderson, & Szykman, 2015; Becker, 1974; Huston, 2012; Raina, 2014). Huston (2012) found that financial literacy was an indicator of lower costs of borrowing for credit cards and mortgages. The research of Gebremariam et al. (2011) indicated that Appalachian regional programs have potential to improve economic factors including income, employment, and migration. The research of Buckland et al. (2013) indicated that poorer individuals, though resilient, do show characteristics of struggling with finance, but have an interest in expanding their knowledge by tracking and learning about financial products. India has used Financial Literacy and Counseling Centre's to focus on improving financial literacy of both rural and urban populations, including educating individuals on better allocating their resources (Raina, 2014). Appalachian Kentucky regional programs could benefit from financial literacy interventions based on the baseline results produced from this study.

Financial literacy is a nationwide problem in the United States. Lusardi and Mitchell (2014) indicated that there is economic value in improving financial knowledge. As reported by Huston (2012), a large percentage of Americans are not sufficiently financially literate. Appalachia remains a high poverty area; specifically, Central Appalachia falls behind the rest of the nation as well as the rest of the Appalachian region in many educational and financial areas (Gebremariam et al., 2011; Partridge et al., 2012; Perdue & Sanchagrin, 2016; Robinson, 2015). With many financial indicators of the region having significantly below average ratings, it would not have been surprising to see that Appalachian Kentucky also lagged in financial literacy.

Having an adequate level of financial literacy allows individuals to have the ability to make better financial decisions and to have a greater financial advantage (Henager & Mauldin, 2015; Huston, 2012). Programs focused on Appalachian regional efforts and improve economic conditions for poorer individuals have shown that those in the Appalachian region often struggle with financial understanding (Gebremariam et al., 2011; Buckland et al., 2013). Van Rooij, Lusardi, and Alessie (2012) found that increased financial literacy is associated with increased wealth. This suggests that improving the financial literacy of Appalachian Kentuckians could improve their income and thereby lower poverty rates. The results from this study indicated that Appalachian Kentucky regional programs could benefit from financial literacy efforts. A more detailed description the theoretical foundations of this study are provided in Chapter 2.

Nature of the Study

This research study was quantitative, utilizing a nonexperimental survey research design. The independent variable for the first research question regarding the difference between the financial literacy of Appalachian Kentuckians and Americans was residency location, and the dependent variable was the level of financial literacy. The residency location variable is binary, since the possible values of the residency location variable are Appalachian Kentucky or the United States. Data for this first research question were analyzed utilizing a *t* test to determine the difference between a mean and a constant. For the second research question regarding the relationship between the level of financial literacy of Appalachian Kentuckians and the key financial indicators, the dependent variable was the financial literacy level of Appalachian Kentuckians, and the independent variables tested were the Appalachian Kentucky poverty rate, the Appalachian Kentucky unemployment rate, and the Appalachian Kentucky personal income rate. Data for the second research question were analyzed using a multiple linear regression to determine if a relationship existed (Douglas & Walker, 2012).

A nonexperimental design was appropriate for this study. The nonexperimental design was chosen for three reasons. First, there was no treatment to be imposed in this study (Sousa, Driessnack, & Mendes, 2007). Second, there was no need for a control group (Sousa et al., 2007). Third, with no control and treatment group, random assignment into such groups was irrelevant (Sousa et al., 2007). All or a combination of these three requirements would have been necessary to meet the experimental or quasi-experimental designs, respectively (Campbell & Stanley, 1963).

The survey research design was chosen because of the need to describe all residents based on a small sample; such generalizations are valuable when large populations are involved (Rea & Parker, 2014). This design also has the advantage of being replicable (Rea & Parker, 2014). Through this study, I demonstrated the level of financial literacy among Appalachian Kentuckians, compared it to national financial literacy rates, and determined if a relationship existed between the financial literacy level of Appalachian Kentuckians and the key financial indicators. The data were collected through a survey of a sample of Appalachian Kentuckians, and existing national data were accessed for use in this study. The use of the survey design allowed the collection of quantifiable data appropriate for this comparison (Rea & Parker, 2014). The methodology used in this study is detailed further in Chapter 3.

Definitions

The following definitions are of terms used throughout this study. These definitions are provided for clarification, consistency, and reference. They are used to clarify terms that may have multiple or unclear meanings. These definitions are provided so that their use is consistent throughout the remainder of the document. They are also provided for the reader to use for reference during examination of the document.

Appalachia: The Appalachian region contains 420 counties from all or part of these 13 states: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia (Appalachian Regional Commission, n.d.a, n.d.d).

Appalachian Kentuckians: Appalachian Kentuckians refers to those people who reside in the Appalachian Kentucky region.

Appalachian Kentucky: Appalachian Kentucky is made up of 54 of the 120 counties in the eastern side of the state of Kentucky that are considered Appalachian (Appalachian Regional Commission, n.d.d).

Central Appalachia: Central Appalachia includes the Appalachian counties from Kentucky, Tennessee, Virginia, and West Virginia (Thorne et al., 2004; Gebremariam et al., 2011; Perdue & Sanchagrin, 2016; Robinson, 2015).

Distressed county: A county is a distressed county when it is in the bottom 10% of the nation's counties for economic status (Appalachian Regional Commission, 2016a; Thorne et al., 2004).

Financial literacy: Financial literacy is the "knowledge of fundamental financial concepts and the ability to do simple financial calculations" (Lusardi & Mitchell, 2011a, p. 510).

Key financial indicators: The key financial indicators are defined specific to this study, and they are the poverty rate, unemployment rate, and personal income rate.

Objective financial knowledge: Objective financial knowledge refers to the applicable knowledge of finance (Robb, 2014).

Level of financial literacy: The average number of correct questions were converted to a percentage score by dividing the average number of correct questions by five (the number of financial literacy questions on the National Financial Capability Study [NFCS]).

Personal income rate: The personal income rate refers to the per capita income rate which is calculated by dividing the total income of the region by the population size (Appalachian Regional Commission, 2016f).

Poverty: An individual or group is considered to be in poverty when it is difficult to obtain the funds to meet basic human needs: food, clothing, and shelter (Khan et al., 2016).

Poverty rate: The poverty rate is the number of persons below the poverty level divided by the total number of persons whose poverty status was considered (Appalachian Regional Commission, 2015).

Subjective financial knowledge: Subjective financial knowledge references people's perceived knowledge or confidence in their own knowledge (Allgood & Walsted, 2013; Robb, 2014).

Unemployment rate: The unemployment rate is the number of persons unemployed divided by the total number of civilians in the labor force (Appalachian Regional Commission, 2016g).

Assumptions

An assumption made in this study was that the survey to be used to measure financial literacy is effective in this measurement. With the lack of a universal definition of financial literacy and therefore a lack of universal measurement tool, it is unknown if the measurement is truly effective (Knoll & Houts, 2012). Though the three questions used to measure financial literacy do not constitute a universal measurement tool, they have been employed by various other studies to measure financial literacy in various

populations (FINRA Investor Education Foundation, 2013, 2016a; Lusardi & Mitchell; 2011a; Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014; Potrich, Vieira, & Coronel, 2016; Schuhen & Schürkmann, 2014). Another assumption was that the chosen definition of level of financial literacy was effective based on the three commonly used questions drafted by Lusardi and Mitchell (2011a).

Scope and Delimitations

Potential issues related to the research problem and conclusions are those that may affect the internal validity of the study (Chalamandaris, Wilmet-Dramaix, Eslea, Ertesvag, & Piette, 2016; Rooney et al., 2016). The research problem was focused on comparing the financial literacy level of Appalachian Kentuckians to that of Americans. The specific choice of the statistic used to represent the national financial literacy rate may have posed a threat to the internal validity of the study. The study of this problem required the use of existing levels of financial literacy as reported by FINRA Investor Education Foundation, and the use of two sets of data collected at different times can affect the internal validity of the study (Chalamandaris et al., 2016). Internal validity, then, was dependent upon the validity of the National Financial Capability Study, because the national financial literacy rate was obtained from that study for comparison with the results from this study. In this study I did not intend to imply causation because no treatment was being imposed. Thus, there were no internal validity issues to be considered in this area.

External validity focuses on the issues of population and theories related to the area of study that can affect the outcomes of the study (Datler, Jagodzinski, & Schmidt,

2013; Rooney et al., 2016). The delimitations of the study include the bounds of the study based on the sample used (Rooney et al., 2016). Since the sample was obtained from a mathematically average county, it did not include a sample from every county, though the county was chosen by its ability to represent the entire Appalachian Kentucky region based on the three key financial indicators. The estimation of the statistics could be above or below the actual value of the financial literacy rate for the Appalachian Kentucky region (Rooney et al., 2016). In addition, the participants were self-selected even though the county that the sample came from was mathematically supported. This could have limited the study and affected the external validity of the study in terms of representing all Appalachian Kentuckians. It should be noted, however, that a large range of ages and incomes of Appalachian Kentuckians can be represented by this sample.

Limitations

There were three major limitations to be considered in this study. The first was related to the population, the second was the survey instrument, and the third was the design of the experiment. There are 54 counties in the Appalachian Kentucky region, and the population is quite large at 1,184,278 as of April of 2010 (Appalachian Regional Commission, n.d.d, n.d.b). With time constraints preventing the feasibility of obtaining data from the entire population, a limitation of this study was the inability to survey the entire population or more counties from the population. To remedy this, I chose to obtain the sample from a mathematically average county based on the three key financial indicators in Appalachian Kentucky to serve as a representative of the entire population. The county from which I chose to obtain the sample was based on careful mathematical

foundations. This is discussed further in the methodology section of Chapter 3. Because of the mathematical foundation, I assumed that the sample could be considered representative of the population, allowing for generalizability within the bounds of this study.

The second limitation was based on measuring financial literacy. I chose to use the widely-used set of three questions developed by Lusardi and Mitchell (2011a) to measure financial literacy for this study. These questions have been employed by various other studies (FINRA Investor Education Foundation, 2013, 2016a; Lusardi & Mitchell, 2011a, 2011b, 2014; Potrich et al., 2016; Schuhen & Schürkmann, 2014). In particular, these questions were used in the financial literacy portion of the National Financial Capability Study (FINRA Investor Education Foundation, 2013, 2016a). This survey is the chosen instrument for obtaining the financial literacy data in this study (FINRA Investor Education Foundation, 2013, 2016a). In addition, this survey was used to obtain the data, since existing national data had been obtained through this survey (FINRA Investor Education Foundation, 2016a). Use of the same survey made it possible to compare the Appalachian Kentucky and the national rates. The validity of the survey was assumed as it was not reported by FINRA Investor Education Foundation (2016a).

A third limitation to this study was based on the design of the study. The study was a cross-sectional design. Collection of cross-sectional data does not allow the interpretation of causation (Robb, Babiarz, Woodyard, & Seay, 2015). In this study I was unable to determine the causation of financial literacy levels. However, this study was designed to determine if there was a correlation between the financial literacy levels of

Appalachian Kentuckians and the key financial indicators. Future research could determine the cause of the Appalachian Kentucky financial literacy levels.

Significance of the Study

There is currently a gap in the understanding of the financial literacy levels of the Appalachian Kentucky region. This study produced data necessary to gaining attention to the financial literacy position of the residents of this region. At the same time, this study may help to fill a gap in the current literature by describing the current condition of Appalachian Kentucky in terms of financial literacy. By comparing financial literacy rates in Appalachian Kentucky to national financial literacy rates, the study may demonstrate baseline rates for financial literacy in Appalachian Kentucky. The Appalachian Kentucky region remains underrepresented in the literature in financial literacy, hence this study will make an original contribution to the literature. I was unable to determine a preexisting baseline for financial literacy rates in Appalachian Kentucky in the literature; it seemed, based on the literature search, one did not yet exist prior to this study. These rates were obtained through this research study, and the subsequent comparison was made, thus positive social change could be an outcome of this study by encouraging more attention for financial literacy efforts for Appalachian Kentuckians.

Significance to Theory

The study of financial literacy is a new topic in the field of finance (Allgood & Walsted, 2013; Finke & Huston, 2014; Knoll & Houts, 2012). Some of the variables that have already been studied as they relate to financial literacy include gender, educational level, race, and socioeconomic status (Lusardi & Mitchell, 2011a; Nawaz, 2015; Potrich

et al., 2016; Thorne et al., 2004). There appears to be no understanding of the financial literacy of Appalachian Kentuckians, as a population. The poor levels in terms of the three key financial indicators may provide an opening for improving the understanding of how financial literacy relates to poverty, unemployment, and personal income. This study also provides opportunity to reestablish a theoretical focus on desolate regions of the United States, such as Appalachian Kentucky.

Significance to Practice

The economic state of the Appalachian region of the United States has been desperate for quite some time. There has been national attention drawn to the plight of the region; the most notable instance was when President Lyndon B. Johnson initiated the Appalachian Regional Commission, which is a governmental agency dedicated to the needs of the region (Compion, et al., 2015; Douglas & Walker, 2012; Thorne et al., 2004). Appalachians, as a whole, fall behind the standards set by the entire nation, but the Appalachian Kentucky region is one of the most desperate areas of Appalachia (Appalachian Regional Commission, 2016d; Gebremariam et al.; 2011; Thorne et al., 2004). The literature has also shown an existing financial literacy problem nationally, and this translates into a concern for both individuals and managers (FINRA Investor Education Foundation, 2013, 2016a; Huston, 2012; Lusardi & Mitchell, 2014; Mandell, 2008; OECD, 2013).

This study offered an opportunity to explore the financial literacy of Appalachian Kentuckians and the relationship of the financial literacy levels with poverty, unemployment, and personal income rates. Determining a baseline for the financial

literacy levels of the region and the relationship with the key financial indicators offered a new area of focus for policy makers and other officials. A result of this study could be new policies and programs to improve the financial well-being of the residents of this desolate region.

Significance to Social Change

The ability for individuals to make better financial decisions, to have a better financial advantage, and to be more valuable, and hence employable, to managers has been shown to be a result of having adequate levels of financial literacy (Huston, 2012). For instance, Huston (2012) found that financial literacy was an indicator of lower costs of borrowing for credit cards and mortgages. This could yield an opportunity for financial literate individuals to reduce these types of debt. The research of Gebremariam et al. (2011) indicated that Appalachian regional programs have potential to improve economic factors including income, employment, and migration. The research of Buckland et al. (2013) indicated that poorer individuals, though resilient, do show characteristics of struggling with finance but show an interest in tracking and learning about financial products; hence, both the need and want to be more financially literate exists. James and James (2016) indicated from their literature search that many of the program and policy attempts at improving the economic stance of the Appalachian region were difficult to assess. The need for effective social change still exists. Appalachian Kentucky regional programs could benefit through the inclusion of financial literacy efforts, since the baseline results produced from this study did indicate a need.

There is a need in Appalachian Kentucky for change that can determine new ways to make a difference in the poor economic state of the region (James & James, 2016). These changes may come from investigating the financial literacy levels of the residents of this region. Investment in Appalachian Kentucky is necessary to determine if improvements to the financial literacy of the residents is necessary. If so, then positive social change will be a result by improving both human and social conditions through their financial well-being may increase and help to begin to liberate the so many dependent upon governmental programs.

Summary and Transition

Chapter 1 served as an introduction to this study of financial literacy in Appalachian Kentucky. This chapter offered a brief background on the study which will be expanded upon in the literature review of Chapter 2. The problem statement, purpose of the study, and research questions along with the corresponding hypotheses were presented in this chapter. For the convenience of the reader and continuity, a set of definitions were provided as part of the introduction chapter of this study. The nature of the study was described as was the assumptions, scope and delimitations, and limitations. Finally, an explanation of the significance of this study was provided as it relates to theory, practice, and social change.

Chapter 2: Literature Review

The existing concern for the financial literacy levels of the nation is the general problem to be studied (FINRA Investor Education Foundation, 2013, 2016a; Huston, 2012). The lack of understanding of the financial literacy level in the Appalachian Kentucky region is the more specific concern of this study. The region is broadly known for poverty (Deaton & Niman, 2012; Douglas & Walker, 2012; Greenberg, 2016; Partridge et al., 2012; Perdue & Sanchagrin, 2016; Scanlan, 2014). There have been initiatives to attempt to improve the key financial indicators (poverty, unemployment, and personal income) of the region, but a deficit still exists (Douglas & Walker, 2012; Robinson, 2015; Scanlan, 2014; Thorne et al., 2004).

The main purpose of this study was to demonstrate the level of financial literacy for Appalachian Kentuckians and to compare this to the national level. In addition, I intended in this study to compare financial literacy levels to the key financial indicators. Research has demonstrated that the Appalachian region loses educated residents to the pursuit of better opportunities; improving financial literacy can help retain these residents (Gebremariam et al., 2011; Ludke & Obermiller, 2014; Scanlan, 2014). Financially literate employees can be more receptive to management decisions, including financial decisions (Lemmer & Sampson, 2015; Vitt, 2014). This could improve the ability for managers to communicate with and maintain their employee pool, which in turn could affect the key financial indicators. A better understanding of the population's financial literacy can provide the attention needed to improve the Appalachian Kentucky region's poverty, income, and unemployment rates.

Literature Search Strategy

The Walden University Library was the primary library source consulted for reviewing literature for this research project. Initial searches were conducted in Thoreau because it encompasses several databases. I also accessed ScienceDirect, Google Scholar, Sage Premier, EBSCO, and ERIC for this study. In addition, I used the Google search engine to find reference information for specific articles such as a journal's homepage and to track down identifying information for citations.

The relative newness of financial literacy in research and the lack of consistent terminology placed some limitations on the literature search strategy (Allgood & Walsted, 2013; Finke & Huston, 2014; Knoll & Houts, 2012). For instance, financial literacy, financial education, and financial capability have been used interchangeably in the literature (FINRA Investor Education Foundation, 2013; Finke & Huston, 2014; Huston, 2015; O'Neill & Xiao, 2015). Key search terms included *financial literacy, financial capability, financial education, Appalachia, Kentucky, quantitative, poverty, unemployment, income, employees, management, validity, FINRA, National Financial Capability Study, NFCS, human capital, Gary S. Becker, reliabil*,* and *valid*.* Searches combining financial literacy with these terms were also employed.

The breadth of the search for this study mostly encompassed the years 2012 to 2017. Literature dated outside of this range was considered when it benefited the study. Seminal literature was also consulted, including both Becker's books that offer detail to his theory of social interactions and theory of human capital (Becker, 1974, 1993). Other than books, the primary literature consulted were peer-reviewed journal articles. Data and

statistics were also obtained from the Appalachian Regional Commission website, a government appointed organization, as the main source for data related to Appalachia. The FINRA Investor Education Foundation, an organization that consults with the United States Department of Treasury and President's Advisory Council on Financial Literacy, was also a main source for the national financial literacy data; data was obtained by consulting the FINRA Investor Education website (FINRA Investor Education Foundation, 2016a).

Theoretical Foundation

Gary S. Becker's theory of human capital, initially introduced in the 1960s, guided this study of financial literacy in Appalachian Kentucky (Becker, 1974, 1993; Siow, 2015). This theory was also used in James and James' (2016) study of economic growth in the Sun Belt region of Appalachia. Compion et al., (2015) studied the effectiveness of economic development organizations in Appalachian Kentucky through the lens of social capital theory that includes human capital as one of its primary components. Becker's theory of human capital is centered around the economic value of human beings; that is, human beings can be considered a resource in a nontraditional sense. Becker (1993, p. 15) asserted that knowledge, health-related expenses, and even honesty can be considered capital by those investing in these areas. This is referred to as human capital because these items cannot be separated from humans, and these types of capital are gone once the human is no longer available (Becker, 1993, pp. 16, 24). Further, Becker (1993, pp. 17, 19) claims that the largest investments in human capital

are in the form of education and other knowledge increasing activities, where the results can be seen in the form of financial gains.

Becker is a pioneer of human capital theory and was bestowed several awards, including the Nobel Prize in Economics; Becker is cited as one of the original researchers to recognize human capital as integral to economic improvement (Badea & Rogojanu, 2012; Becker, 1993; Khan et al., 2016; Levine, 2008; Siow, 2015). His focus was on applying economics to other areas such as the study of human capital (Siow, 2015). Huston (2015) explained the value in financial education in terms of increasing human capital. Financial knowledge has been characterized as a specific type of human capital (Finke & Huston, 2014; Potrich et al., 2016). Human capital is essential to organizational growth (Becker, 1993, p. 24). Research has indicated that Appalachian regional programs have potential to improve economic factors including income, employment, and migration (Gebremariam et al., 2011). The Appalachian Kentucky region is in need of economic improvement and growth (Douglas & Walker, 2012; James & James, 2016; Thorne, et al., 2004). Hence, it was the purpose of this research to look at the financial literacy of the region from the human capital perspective. It is necessary to understand the financial literacy of Appalachian Kentuckians in order to determine their human capital contributions to improve the key financial indicators.

Human capital theory often focuses on the education and health of the population of interest (Becker, 1993, p. 17; Callander, Schofield, & Shrestha, 2012; James & James, 2016; Khan et al., 2016; Winters & Chiodi, 2011). Since financial literacy indicates an

understanding of financial topics, it is relevant to consider it in relationship to human capital.

Existing research shows connections between financial literacy and human capital with the key financial indicators for this study: poverty rate, unemployment rate, and personal income rate (Henager & Mauldin, 2015; Huston, 2012). A study by Buckland et al. (2013) indicated that poorer individuals struggle with understanding finance, yet they indicate an interest in improving that position. Winters and Chiodi (2011) reviewed how a governmental program designed to focus on human capital indicated improvements in poverty when human capital investments were promoted. Khan et al. (2016) found that in the district Karak Khyber Pakhtunkhwa, increases in variables associated with human capital offered a reduction in poverty. Financial literacy has been shown to be associated with lower borrowing costs for consumers (Huston, 2012). Lower borrowing costs means that consumers get to keep more of their income.

A focus on improving financial literacy for a population can be seen as an investment in human capital from the perspective of management (Huston, 2012; Lusardi & Mitchell, 2014). James and James (2016) discuss the low human capital of Central Appalachians in their study of economic growth in Appalachia. A growth in personal financial knowledge should be viewed as an increase in human capital (Henager & Mauldin 2015; Huston, 2015). Rural regions tend to have less diverse employment opportunities because the population is homogenous and can lack the adequate skills to attract better opportunities (Khan et al., 2016). Having a financially literate staff allows employees to better understand the necessary financial and finance-related business

decisions (Lemmer & Sampson, 2015). As an example, Lemmer and Sampson (2015) demonstrated that a financially literate library staff allows the staff to be more aware of, and invested in, financially related decisions by management, such as budgeting decisions. Financially literate individuals can also manage more responsibility in their assigned job functions (Lemmer & Sampson, 2015). They are also able to support management's financial decisions; financially literate library staff can support endeavors to improve finances through negotiating expenses, for example (Lemmer & Sampson, 2015). Bhattacharya and Haldar (2013) found that Indian states that spent less on human capital improvements had higher levels of poverty. James and James (2016) found that human capital is inconsistent in different regions of Appalachia. James and James suggested that states spend more on human capital to improve poverty rates.

Literature Review

The Appalachian Kentucky area is just a small part of the Appalachian region. Yet, this particular area contends with the worst economic status of the region (Appalachian Regional Commission, 2016a). The Appalachian Regional Commission (2016a) showed that approximately 68% of the counties in Appalachian Kentucky are classified as distressed. That is, according to the Appalachian Regional Commission, 37 of the 54 Appalachian Kentucky counties are distressed; that was more counties than of any other state's Appalachian region.

In the literature review that follows, I focus on Appalachian Kentucky, financial literacy, and the key financial indicators. The review begins with defining Appalachia and then narrows to focus on Appalachian Kentucky. I then transition to a discussion on

the key financial indicators. Following that, I briefly describe the different definitions of financial literacy to justify the choice of the definition used in this study, the one based on Lusardi and Mitchell's (2011a) work. This is followed by a discussion on the existing literature regarding financial literacy levels in America and other populations. Lastly, I offer a discussion on existing financial literacy tools with a focus on the decision to use the National Financial Capability Study.

Defining Appalachia

The Appalachian region was named after the Appalachian Mountain range; those who inhabit the region are referred to as Appalachian. Residing in the region can be difficult and isolating due to the mountainous terrain (Douglas & Walker 2012; Robinson, 2015). There are various definitions of the Appalachian Region. This research utilizes the definition provided by that of the Appalachian Regional Commission. Douglas and Walker (2012) argue that the Appalachian Regional Commission's definition of the Appalachian region was the most popularly used, but was politically based and, hence, designed to include the poorer regions. However, the use of the Appalachian Regional Commission's definition has been widely used by the literature either to directly obtain archival data or to provide support for a research topic, so this will be the definition adopted for use in this study (Compion et al., 2015; Deaton & Niman, 2012; Douglas & Walker, 2012; Gebremariam et al., 2011; James & James, 2016; Ludke & Obermiller, 2014; Perdue & Sanchagrin, 2016; Scanlan, 2014; Thorne et al., 2004; Robinson, 2015).

According to the Appalachian Regional Commission (n.d.a; n.d.d), the Appalachian region contains 420 counties from all or part of 13 states that extend from the state of New York to Mississippi. Specifically, Appalachian Kentucky refers to the region of Kentucky that is classified as part of the Appalachian region; the people of this region will be referred to as Appalachian Kentuckians throughout this study. There are 120 counties in Kentucky of which 54 are classified as Appalachian counties (Appalachian Regional Commission, n.d.d). The Appalachian Kentucky counties are all concentrated on the eastern side of the state. Researchers suggested that the geographic difficulties and isolation of the region by the mountain range have contributed to the economic issues of the Appalachian region (Douglas & Walker, 2012; James & James, 2016; Robinson, 2015). The Appalachian Kentucky region is further isolated and growth is restricted further by its distance from major cities and rural areas (Thorne et al., 2004).

The map in Figure 1 depicts the Appalachian region per the Appalachian Regional Commission (2016a). The counties are shown and highlighted based on the economic status of the region per the Appalachian Regional Commissions definition of the economic status. The economic status was calculated based on the poverty rate, unemployment rates, and the personal income rates of the residents as compared to the rest of the nation. It can be seen in the Appalachian Regional Commission's map that Appalachian Kentucky was in a dire situation as compared to the rest of the region, since the majority of the counties were labeled as "distressed." Distressed meant that the county is in the bottom 10% of the nation's counties for economic status (Appalachian Regional Commission, 2016a).

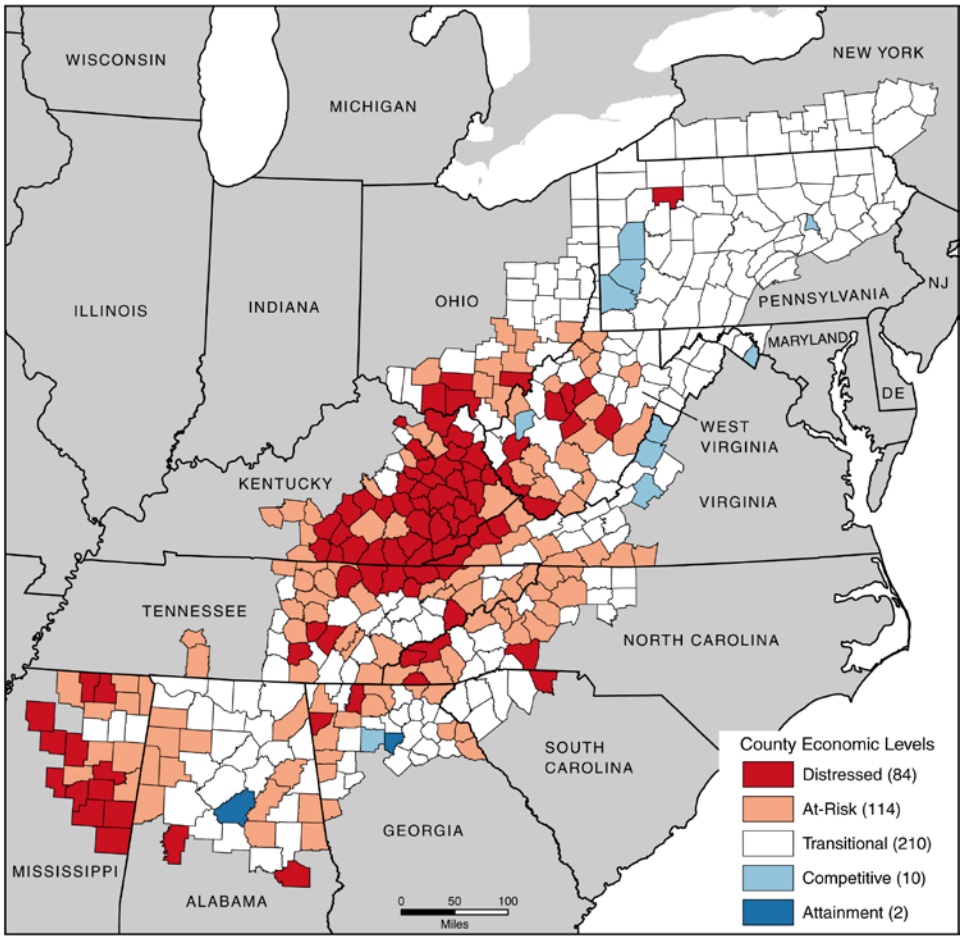

Figure 1. Economic status of Appalachian counties.

The economic state of the Appalachian region has been a national concern for at least as far back as 1965 when President Lyndon B. Johnson began to bring the position of the region to national attention (Compion, et al., 2015; Douglas & Walker, 2012; Scanlan, 2014; Thorne et al., 2004). At that time, President Johnson initiated the development of a dedicated government agency, called the Appalachian Regional Commission (Douglas & Walker, 2012; Scanlan, 2014; Thorne et al., 2004). The more

specific purpose of this agency was to focus on developing the much-needed improvement initiatives, programs, and policies focused on the Appalachian region (Douglas & Walker, 2012; Thorne et al., 2004).

Characteristics of Appalachia. Appalachians have not been noted for being a diverse culture. Rather, the region maintained a consistent culture attributed to the isolated, rurality of the region; that is, there has been a consistency in culture throughout the region, especially south of the New England region (Douglas & Walker, 2012; Robinson, 2015). Appalachian Americans have been described based from many different points of view. For instance, they can be described based on location since the Appalachian region is so vast (Douglas & Walker, 2012; Robinson, 2015). They can also be described based on economics or educational status (Robinson, 2015).

The Central Appalachian region has been characterized based on economics, education, age, culture, faith, and heritage. Central Appalachia is the region centrally located and includes Appalachian counties from Kentucky, Tennessee, Virginia, and West Virginia (Gebremariam et al., 2011; Perdue & Sanchagrin, 2016; Robinson, 2015; Thorne et al., 2004). This central part of Appalachia, which includes Appalachian Kentucky, is heavily inhabited by individuals of Scottish and Irish lineage (Douglas & Walker, 2012). Most of this central region has been classified as being economically distressed and economically disadvantaged (Appalachian Regional Commission, 2016a; James & James, 2016; Robinson, 2015; Thorne et al., 2004).

The Appalachian region, especially the Central Appalachian region, is often defined by poverty; yet, it is also well-noted for being a resilient, family focused, and

independent culture (Douglas & Walker, 2012; Greenberg, 2016; Robinson, 2015; James & James, 2016; Thorne et al., 2004). Poverty in the region has been shown to affect the female population more so than the male population (Thorne et al., 2004). That is, gender was shown to be associated with poverty, with females at more of a disadvantage than males; this held true even in Appalachia where there were even more distinctions between genders in central Appalachia (Thorne et al., 2004).

The residents of the Central Appalachian region have also been classified as being educationally limited (Douglas & Walker, 2012; Greenberg, 2016; Robinson, 2015; Thorne et al., 2004). Previous research indicated that the population of this region were older in age than other populations in the United States; that is, there were also high numbers of elderly residents in the Appalachian region (Gebremariam et al., 2011; Ludke & Obermiller, 2014).

Three Key Financial Indicators

With the Appalachian region being noted for having economic distress, a specific set of variables were compiled for research in this study and are referred to in this study as the three key financial indicators. These three key financial indicators were used to identify the state of the Appalachian Kentucky region in terms of finances. They included the poverty rate, unemployment rate, and personal income rate. Central Appalachian counties have been shown to demonstrate some of the worst rates for the three key financial indicators, and furthermore, Appalachian Kentucky demonstrated even worse rates for these three variables (Perdue & Sanchagrin, 2016). These three variables were chosen because of the financial disadvantage they indicated for the Appalachian

Kentucky region, and because research indicated that these variables were concerning to the economic state of the region (Deaton & Niman, 2012; Gebremariam et al., 2011; Perdue & Sanchagrin, 2016; Thorne et al., 2004).

Table 1 demonstrates the values of the three key financial indicators for the four regions relevant to this study: United States, Appalachia, Appalachian Kentucky, and the sampled average Appalachian Kentucky county. The inclusion of the average county is for reference, as this represented the county that the sample was taken from. The table offers these values in two forms for reference. Each value presented in the table was calculated as a percentage of the national value. Such comparisons are more relevant when the values are measured in this same unit of measure.

Table 1

Key Financial Indicators for Four Regions.

	Poverty rates, 2010-2014	Poverty rates, percentage of U.S. average	Per capita income (U.S. dollars), 2014	Income, percentage of U.S. average	Unemployment rates, 2014	Unemployment, percentage of U.S. average
United States	15.6%	100.0%	$46,049	100.0%	6.2%	100.0%
Appalachia	17.2%	110.2%	$37,260	80.9%	6.5%	105.3%
Kentucky	18.9%	121.3%	$37,396	81.2%	6.5%	105.2%
Appalachian Kentucky	25.4%	163.0%	$30,308	65.8%	8.5%	138.3%
Average County	26.7%	171.2%	$28,128	61.1%	9.0%	146.6%

Aa comparison of the three key financial indicators for all four regions relevant to this study were presented in this table. The values are presented two forms each (Appalachian Regional Commission, 2016c, 2016h, 2016e, n.d.c).

The literature and the Appalachian Regional Commission data indicate that the Appalachian Kentucky region has been in need for quite some time, based on the three key financial indicators (Appalachian Regional Commission, 2016a; Deaton & Niman, 2012; Douglas & Walker, 2012; Gebremariam et al., 2011; Partridge et al., 2012). Many researchers indicated the continued poor economic state of the region (Deaton & Niman, 2012; Douglas & Walker, 2012; Gebremariam et al., 2011; Partridge et al., 2012). Gebremariam et al. (2011) and Thorne et al. (2004) explained that in the 1990s, Appalachia was struggling even while the nation as a whole was seeing growth economically. Gebremariam et al. (2011) focused further on central Appalachia and explained that central Appalachia was in an even more depressed economic state than the whole Appalachian region. Deaton and Niman (2012) also found that central Appalachia suffered the most in terms of poverty rates, even though the rates have improved since the 1960s. Perdue and Sanchagrin (2016) studied the relationship of poverty, unemployment, and income with prison construction in central Appalachia; they determined that there is not a significant benefit of prison construction as a means of economic growth. The persisting dire situation of Central Appalachia based on existing research and the reports of the Appalachian Regional Commission helped to focus this study more specifically on Appalachian Kentucky region (Appalachian Regional Commission, 2016d; Gebremariam et al.; 2011; Greenberg, 2016; Perdue and Sanchagrin, 2016; Thorne et al., 2004). The specifics are discussed next for each of the three key financial indicators.

Measurement of the three key financial indicators. The source chosen to access the data for measuring the key financial indicators of the Appalachian Kentucky

region was data collected by the Appalachian Regional Commission's annual review. The agency has been collecting data for the Appalachian region since its development based on its desire to improve the economic standing of the region (Appalachian Regional Commission, n.d.a; Douglas & Walker, 2012; Thorne et al., 2004). The Appalachian Regional Commission collected data at various levels and included national values in the reports. The levels included state, regional, and county levels. Data was collected on county economic status, population, income, poverty levels, unemployment levels, education levels, and geography (Appalachian Regional Commission, n.d.a.; Gebremariam et al., 2011; Thorne et al., 2004). This offered many options for comparisons and research opportunities.

Appalachian Regional Commission data has been used in various other studies, and some even related the Appalachian region with the key financial indicators (Anglin, 2016; Deaton & Niman, 2012; Greenberg, 2016; Kratzer, 2015; Thorne et al., 2004). Deaton and Niman (2012) used Appalachian Regional Commission data to study the relationship between mining, employment, and poverty in Appalachia; they determined that mining improved poverty in the short term, but not in the long term. Thorne et al. (2004) accessed data collected by the Appalachian Regional Commission for use in their study of the economic position of the Central Appalachian Region, which included Appalachian Kentucky. Greenberg (2016) found that a nonlinear, "u" shaped relationship existed between poverty in central Appalachia and regional distance to a county seat. Appalachian Regional Commission data was used by Kratzer (2015) to study the

relationship between economic data, including the three key financial indicators, and coal production; the study found that increased coal production hindered population growth.

There are various potential reasons that the Appalachian Regional Commission data has been so commonly used for research relating to the Appalachian region. It was previously discussed that the Appalachian Regional Commission collected data at many levels and measured many variables. Thorne et al. (2004) accessed data collected by the Appalachian Regional Commission for use in their study of the economic position of the central Appalachian region, which included Appalachian Kentucky. Recent data can be conveniently accessed through the website. In addition, the Appalachian Regional Commission is a governmental body, and with that comes a sense of reliability for the data and collection methods.

Poverty in Appalachian Kentucky. Poverty remains an issue for many regions of the world; poverty is a lack funds to procure the basic human necessities (Callander et al., 2012; Khan et al., 2016). Figure 2 maps the Appalachian region by county. Poverty remained a significant issue in the Appalachian Kentucky region, as indicated in the literature (Greenberg, 2016; Perdue and Sanchagrin, 2016; Thorne et al., 2004). The ranking of each Appalachian county's poverty rate as a percentage of the United States average is indicated by the map (Appalachian Regional Commission, 2015).

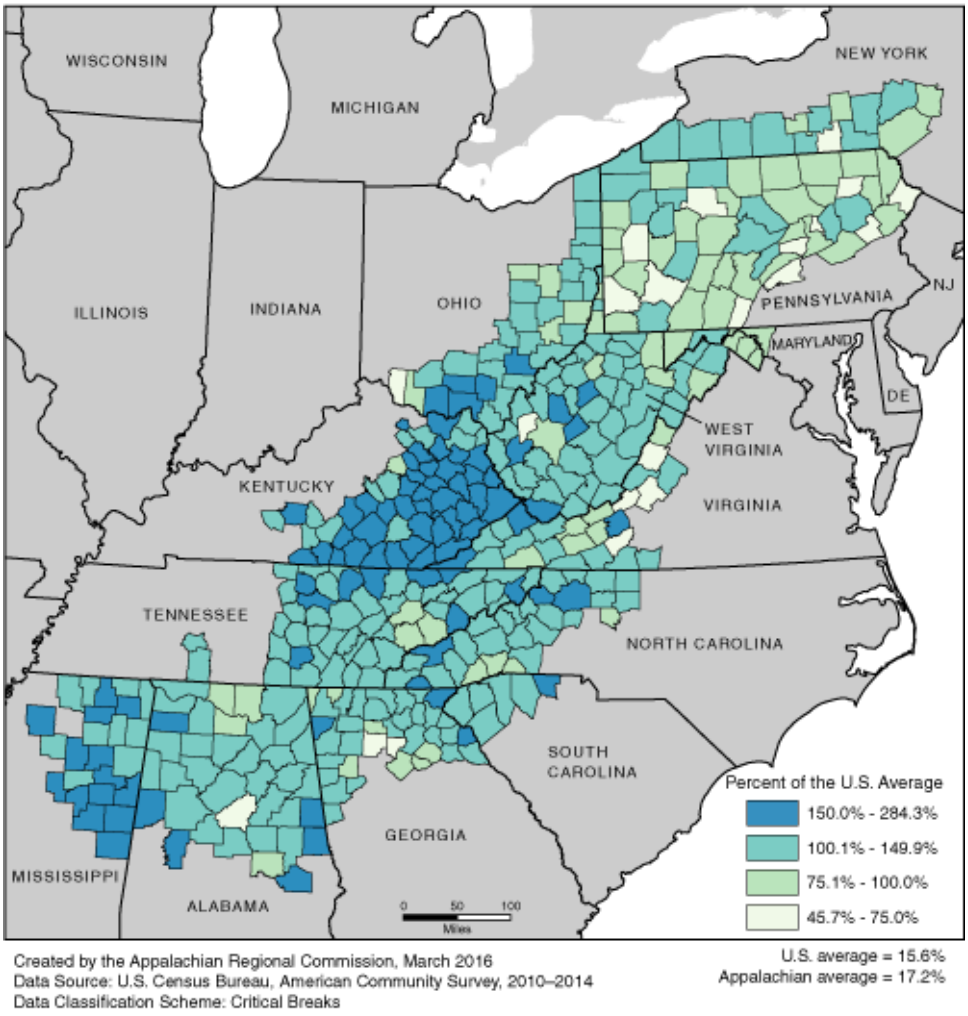

Figure 2. Poverty rates of Appalachian counties.

From the existing research, it can be seen that poverty in the Appalachian region has been a concern. Various studies have reviewed the poverty rates of the region (Gebremariam, et al., 2011; Greenberg, 2016; Perdue and Sanchagrin, 2016; Thorne et al., 2004). Poverty rates remain high, as they have been historically, in the Appalachian region (Appalachian Regional Commission, 2016d; Gebremariam et al.; 2011; Thorne et al., 2004). Specifically, Thorne et al. (2004) emphasized that central Appalachia has

tended to suffer the most in terms of poverty rates in Appalachia. Deaton and Niman's (2012) research confirmed that poverty continued to be a major concern in Central Appalachia. Perdue & Sanchagrin (2016) discussed the concern for poverty in Central Appalachia, while emphasizing that it was even worse in Appalachian Kentucky; specific to their research, they found that central Appalachian counties with prisons had higher poverty rates than those without. When ranking the states that make up the Appalachian region in terms of poverty rates, Appalachian Kentucky had the highest poverty rate (Appalachian Regional Commission, 2016d). Based on the years 2010 to 2014 as reported by the Appalachian Regional Commission, the poverty rate of Appalachian Kentucky was 25.4% or 163% of the national average (Appalachian Regional Commission, 2016d).

Unemployment in Appalachian Kentucky. Unemployment rates are another variable of concern for the Appalachian region (Deaton & Niman, 2012; Gebremariam et al., 2011). Recent information from the Appalachian Regional Commission (2016i) indicated that Appalachian Kentucky had the second highest unemployment rate for Appalachian regions in 2014 at 8.5%, trailing only behind Mississippi at 8.8%. This meant that, according to the Appalachian Regional Commission (2016i), Appalachian Kentucky's unemployment rate was 138.3% of the national average. This information can be seen in the map that is Figure 3, which demonstrates the unemployment ranking of counties in the Appalachian region as computed as a percentage of the national values (Appalachian Regional Commission, 2016g).

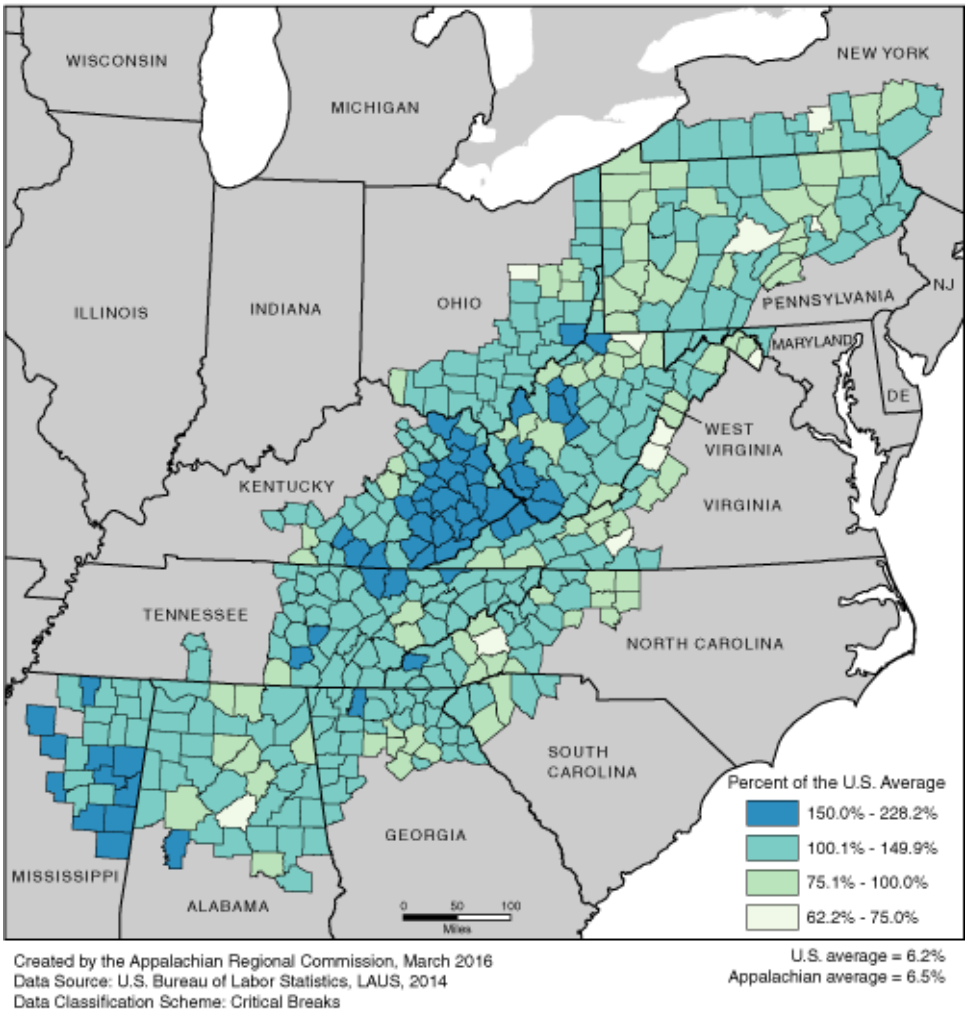

Figure 3. Unemployment rates of Appalachian counties.

Studies have considered the employment issues in the Appalachian region and indicate them as an ongoing concern (Deaton & Niman, 2012; Perdue & Sanchagrin, 2016; Gebremariam et al., 2011). Deaton and Niman (2012) demonstrated that central Appalachia has maintained some of the highest unemployment rates in Appalachia. Gebremariam et al. (2011) explained that there has been a consistent issue with low employment rates in the central Appalachian region, and with their research, they found

that unemployment was interdependent with migration (into and out of the region) and income. Perdue and Sanchagrin (2016) found that the development of prisons did lower unemployment but at the same time personal income also lowered for the region.

Personal income in Appalachian Kentucky. The personal income rates of Appalachian Kentucky are concerning. There have been studies that focus on the personal income issues in the Appalachian region (Gebremariam et al., 2011; Perdue & Sanchagrin, 2016; Robinson, 2015; Thorne et al., 2004). The research of Thorne et al. (2004) and Gebremariam et al. (2011) both indicated that Central Appalachia suffers more than the rest of the Appalachia in regard to income rates. Perdue and Sanchagrin (2016) researched how developing prisons in central Appalachia impacted the three key financial indicators in that region to see if a positive economic effect could result; their results indicated that prison development did not have a positive economic effect.

In 2014, the personal income rate in Appalachian Kentucky was $30,308 according to the Appalachian Regional Commission (2016b). This translated to an equivalent of 65.8% of the national average of personal income rates (Appalachian Regional Commission, 2016b). This demonstrated another instance where Appalachian Kentucky ranked the lowest of the Appalachia (Appalachian Regional Commission, 2016b). These rankings are demonstrated in the map in Figure 4, which identified the per capita income rates of Appalachian counties (Appalachian Regional Commission, 2016c). It can be seen that there remained a current issue with poor personal income rates in the Appalachian Kentucky region.

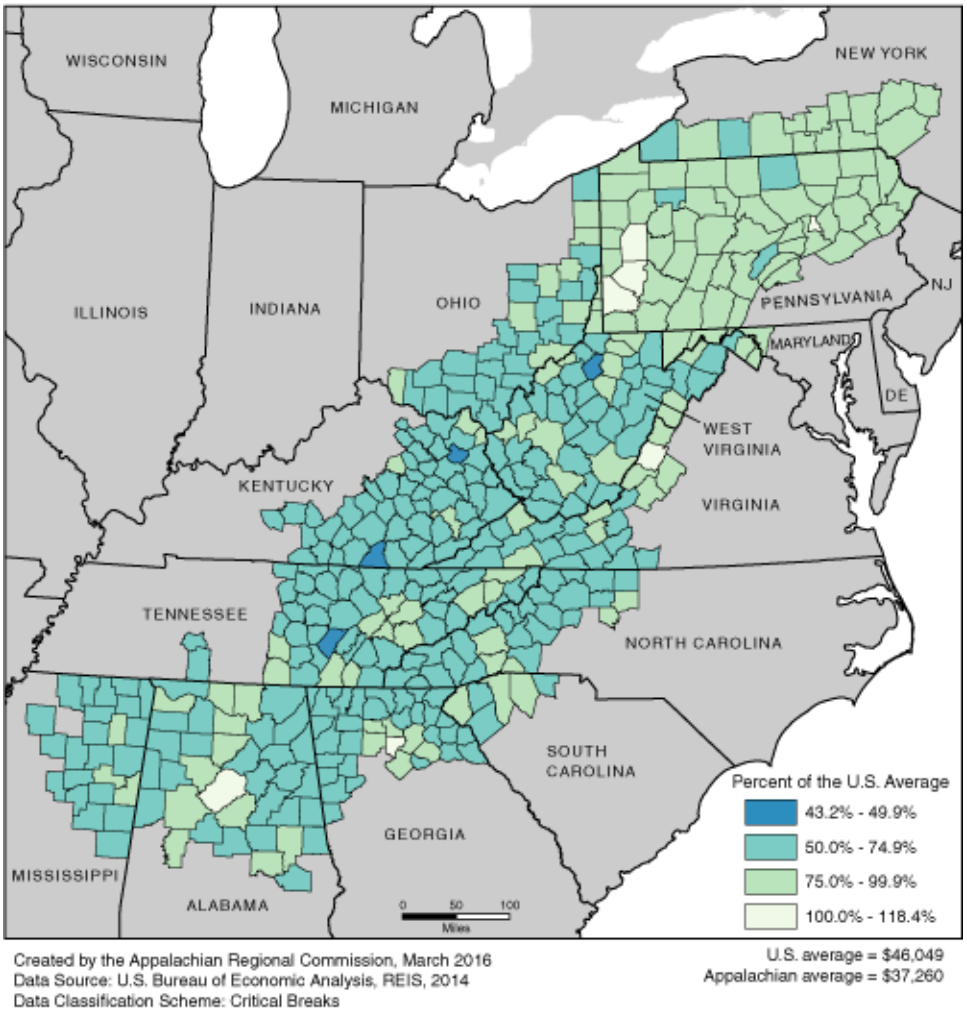

Figure 4. Personal income rates of Appalachian counties.

I have shown instances of how Appalachian Kentucky lagged in comparison to the rest of the nation based on the three financial indicators. This study aimed to understand the relationship of these variables with financial literacy. The next few sections defines financial literacy and discusses the existing concern for poor financial literacy levels as well as existing research with the three financial indicators.

Defining Financial Literacy

Defining financial literacy is a task that remains to be universally accomplished; that is, there is no universal definition of financial literacy (Allgood & Walsted, 2013; Henager & Mauldin, 2015; Huston, 2010; Knoll & Houts, 2012; Lusardi, 2015; OECD, 2013; Robb, 2014). The need for a universal definition of financial literacy exists, but that development is beyond the scope of this paper. A brief description of those existing definitions and terminology was warranted to justify the definition chosen for this study.

Currently, many definitions exist and are in use throughout the literature, and they vary according to their context and application (Ciemleja, Lace, & Titko, 2014; Henager & Mauldin, 2015; Lemmer & Sampson, 2015; Lusardi, 2015; OECD, 2013). For instance, Organisation for Economic Co-operation and Development (2013) created their definition based on the international need of 15-year old students: "the knowledge and skills that are essential to make financial decisions and plans for their future" (p. 25). Ciemleja et al. (2014) defined financial literacy based on the needs of Latvians, including necessary financial knowledge, financial skills, and financial behavior. Lemmer and Sampson (2015) based their definition on the workplace application of financial literacy, including knowledge and concepts relating to accounting, marketing, and organizational operations. Robb (2014) and Allgood and Walsted (2013) contended that financial literacy should consider two major components, objective knowledge and subjective knowledge. Objective knowledge is applicable knowledge of finance (Henager & Mauldin, 2015; Robb, 2014). Subjective knowledge references the individual's perceived knowledge or confidence in the knowledge (Allgood & Walsted, 2013; Henager &

Mauldin, 2015; Robb, 2014). Potrich et al. (2016) explained that financial literacy commonly "refers to an individual's ability to obtain, understand and evaluate financial information that is necessary to make an efficient decision aiming at the individual's financial well-being" (p. 3). While Lusardi and Mitchell (2011a) concisely defined financial literacy to be the "knowledge of fundamental financial concepts, and the ability to do simple financial calculations" (p. 510). Regardless of the slight differences between the definitions, there were common themes among them all.

The prominent themes among the definitions included financial knowledge, financial behavior, evolution, and confidence (Allgood & Walsted, 2013; Ciemleja et al., 2014; Knoll & Houts, 2012; Lusardi, 2015; OECD, 2014; Potrich et al., 2016; Robb, 2014). Organisation for Economic Co-operation and Development (2014) has emphasized that financial literacy is a lifelong learning process that is continuously evolving. By nature, numeracy and reading are prerequisite components of financial literacy (Lusardi, 2015; OECD, 2014). Financial literacy definitions also commonly included financial knowledge, behavior, and confidence (Ciemleja et al., 2014; knoll & Houts, 2012; OECD, n.d.).

Financial knowledge includes financial skills necessary to succeed in financial situations (Ciemleja et al., 2014; Lusardi and Mitchell, 2011a; Lusardi, 2014; OECD, n.d.). Financial behavior is how individuals apply the financial skills that they possess. Finally, financial confidence refers to an individual's confidence in applying individuals' skills and knowledge in relevant financial situations.

Another important aspect of financial literacy found in the literature was the concept of resource allocation. Raina (2014) explained that financial was a key to allocating existing family resources such as through savings plans and debt planning. The research of Agnew et al. (2015) indicated that many were not prepared to make decisions related to allocating their existing resources when decisions were necessary. Including the idea of resource allocation better prepared individuals for the big financial decisions of life, such as preparing for and managing retirement (Agnew et al., 2015).

According to Organisation for Economic Co-operation and Development (n.d.), financial literacy referred to an individual's financial knowledge and ability to apply such knowledge successfully. Lusardi (2015) acknowledged both these characteristics and further emphasized an importance of understanding the purpose of financial literacy, which was to be successful in making financial decisions. Financial literacy should be continuous; that is, a high level of financial literacy would improve the financial standing of the individual in general, not just temporarily (Lusardi, 2015; OECD, 2014). Based on these consistent themes, this study employed the definition as posed by Lusardi and Mitchell (2011a).

Demographics and Financial Literacy

Relationships between demographic variables and financial literacy have been studied in the existing research. Some researched variables, as related to financial literacy, include gender, education level, race, and socioeconomic status (Lusardi & Mitchell, 2011a; Potrich et al., 2016; Thorne et al., 2004). Gender has been a commonly researched demographic variable, including its relationship with the topic of financial

literacy, and as previously noted has been associated with poverty in central Appalachia (Thorne et al., 2004). Lusardi and Mitchell (2011a) found that women had lower levels of financial literacy than men, less educated individuals had lower levels of financial literacy than those with more education, and that there were racial or ethnic differences in financial literacy levels. However, Lusardi (2015) explained that the PISA results did not indicate an overall difference in gender for financial literacy. Lusardi and Mitchell (2014) indicated that there is a positive association between financial literacy and socioeconomic status for adults.

Lack of Financial Literacy

Financial literacy is both a global and national concern for both individuals and managers (FINRA Investor Education Foundation, 2013, 2016a; Huston, 2012; Lusardi & Mitchell, 2014; Mandell, 2008; OECD, 2013). Many studies and sources demonstrated low levels of financial literacy in American adults and other populations (FINRA Investor Education Foundation, 2013, 2016a; Mandell, 2008; OECD, 2014; Robb, 2014). Financial literacy affects more than just the individual; it also effects the society in which the individual resides (Lusardi, 2015). Financial literacy is recognized as being a necessary characteristic of a successful individual and society as a whole because it has been shown to contribute to success and growth in both economically and financially for the individual and society (OECD, 2013).

Many studies confirm that low levels of financial literacy, in general, are a reality and hence, a concern (FINRA Investor Education Foundation, 2013, 2016a; Lusardi & Mitchell, 2011a; Lusardi & Mitchell, 2014; OECD, 2014; Robb, 2014). Some of the

results were as follows. PISA results indicated that high schoolers in the United States performed just below the mean score in 2012 compared to the other 17 countries that participated (OECD, 2014). Lusardi and Mitchell (2011a) showed that the American population had low levels of financial literacy, particularly in terms of understanding interest, risk, and inflation.

Key Financial Indicators from the Literature

Poverty rates, unemployment rates, and personal income rates were chosen as the key financial indicators for this study based on the ability to use them to describe the economic state of the region as well as the individual counties of the region. This was not the first instance of using a combination of these variables to identify the financial state of the region. The Appalachian Regional Commission utilizes the same key financial indicators employed in this study to indicate the economic status for the Appalachian counties. Recall, that in Figure 1, the majority of the counties in Appalachian Kentucky were considered distressed by this marker (Appalachian Regional Commission, 2016a). Gebremariam et al., (2011) found that employment, migration, and median household income are interdependent and were associated specifically with the region.

Financial Literacy and Poverty

An acceptable level of financial literacy is essential to be a successful member of society. The necessary knowledge needed by the general public to make financial decisions is continually increasing (Robb, 2014). Robb (2014) explained that better financial knowledge should lead to better financial decision making. Poposka (2014) explained that an adequate financial understanding provided those with limited financial

resources to better manage those resources. Raina (2014) explained that to ensure growth, poorer individuals should be specifically included in financial literacy improvement initiatives. A positive association between financial literacy and socioeconomic status has been demonstrated throughout the literature (Lusardi & Mitchell, 2014). Khan et al. (2016) explained that people categorized into poverty were socially as well as financially deprived, and this was often prominent in rural regions. The increase in needed knowledge combined with the need for those of limited resources to have a better understanding leads to a need for better understanding of the financial literacy of certain populations prone to poverty, such as that of Appalachian Kentucky. Lusardi and Mitchell (2011a) found that more financially literate individuals were more retirement ready. Having a more retirement ready population may help to improve future poverty rates nationally (Lusardi & Mitchell, 2011a).

Financial Literacy and Unemployment

Some research was identified regarding the employment status of individuals and financial literacy. Lusardi and Mitchell (2011a) found that individuals who were not employed workers scored lower on their financial literacy assessment than those who were workers. More specifically, the non-working individuals had high response levels for the “do not know” answer choice (Lusardi & Mitchell, 2011a). Employed individuals have been shown to have higher levels of financial literacy than those that are not (Lusardi & Mitchell, 2011b). Lusardi and Mitchell (2011b) explained that this may be due to organizations offering financial programs to their employees.

Financial Literacy and Personal Income

There have been studies that focus on financial literacy and personal income (Henager & Mauldin, 2015; Tuominen & Thompson, 2015). The literature seemed to focus on the low-income population. Henager and Mauldin (2015) focused their research on the understanding of financial concepts and perceived knowledge in low and medium income households. The results of their study indicated that those households with higher perceived knowledge saved more regularly (Henager & Mauldin, 2015). Tuominen and Thompson (2015), through their ethnographic study of low-income individual's perception of their economic situation versus financial literacy initiatives, established that financial literacy initiatives should consider not only the current financial position of those in low-income situations but also the perception of their situation and finances. The research of Buckland et al. (2013) found that poorer individuals struggled with financial literacy but show interest in making improvements. This research indicated that there is a need for a better understanding of the relationship between income and financial literacy.

Financial Literacy and Management

Emphasis on awareness and attention to the financial literacy of employees can have valuable management applications. Measuring financial literacy is important to identifying the current situation in order to begin to understand its potential applications (Ciemleja et al., 2014). Though financial literacy typically focuses on personal finances, it extends to applications in the workplace and society. For instance, many employees are becoming more responsible for their own retirement planning (Allgood & Walsted, 2013). Investing in the financial literacy of employees can provide management with

more capable staff (Lemmer & Sampson, 2015). Organisation for Economic Co-operation and Development (2014) contends that financial literacy is a necessity for life and even employment.

One issue related to maintaining a capable staff as considered for the Central Appalachian region in the literature concerns the region and migration. (Gebremariam et al., 2011; Ludke & Obermiller, 2014). That is, it has been seen that the more educated residents tend to move from the region seeking better opportunities while, at the same time, the Appalachian region is found to be a destination for less educated individuals; thus, the proportion of inadequately educated individuals can grow within the Appalachian region (Gebremariam et al., 2011; Ludke & Obermiller, 2014). This affects the pool of potential employees available to management. Improving the economic situation through the three key financial indicators could potentially encourage the more educated residents to remain in the region, providing an improvement in the pool for managers to choose from to maintain their workforce.

Encouraging financial literacy within the organization can be beneficial to management in many ways (Lusardi & Mitchell, 2014; OECD, 2014). For instance, employees that are more financially literate are more engaged in the well-being of the organization (Vitt, 2014). In turn, being more financially literate within an organization offers more opportunity to improve one's financial literacy through opportunities for application (Vitt, 2014). For instance, financially literate individuals can better understand the organization's financial decisions, such as budgeting decisions made by

management, and thus support and potentially contribute to the financial success of the organization (Lemmer & Sampson, 2015).

Financial Literacy Measurement

The literature is not only lacking in defining financial literacy, but also in measuring financial literacy. There currently exists no universal measurement tool for financial literacy (Ciemleja et al., 2014; Huston, 2010; Knoll & Houts, 2012; Potrich et al., 2016;). This could in part due to the lack of a universally accepted definition of financial literacy as well as the newness of the study of financial literacy (Allgood & Walsted, 2013; Finke & Huston, 2014; Knoll & Houts, 2012). Knoll and Houts (2012) claim that some tools do not even have similar questions.

Existing financial literacy measurement tools were designed to measure the respondent's ability to understand and apply necessary financial literacy knowledge and skills, as well as their subjective or perceived knowledge (Allgood & Walsted, 2013; FINRA Investor Education Foundation, 2016a; Lusardi, 2015; Lusardi & Mitchell, 2011a; Potrich et al., 2016). Lusardi (2015) explained that numeracy is also a natural component of financial literacy, even though it is not typically included as a separate measurement. Lemmer and Sampson (2015) also indicate the importance of numeracy to financial literacy. Potrich et al. (2016) add that financial behavior, which is developed over a lifetime is also an important component of financial literacy. Some tools included a measurement related to the confidence of the individual in applying his or her own knowledge and skills, as well as the associated financial behaviors (Ciemleja et al., 2014;

OECD, n.d.; Potrich et al. 2016). Allgood and Walsted (2013) emphasize the need for measuring subjective knowledge.

A specific measurement tool that included an optional financial literacy component was the Program for International Student Assessment (PISA) (Lusardi, 2015). Program for International Student Assessment was an international survey aimed at individuals at the high school level to determine their level of preparedness to become successful functioning members of society (Lusardi, 2015; Schuhen & Schürkmann, 2014). The study began as a measurement of science, reading, and mathematics; however, in 2012, a new optional financial literacy component was added to the survey (Lusardi, 2015; Schuhen & Schürkmann, 2014). This component remained as an optional component in the 2015 survey (OECD, n.d.). Lusardi (2015) was a contributor to the design of the PISA survey, which focuses on three main areas. The first area was content; this referred to the necessary financial knowledge components (Lusardi, 2015). The second area was processes; this referred to the way the financial knowledge is applied (Lusardi, 2015). Finally, the third area is contexts; this refers to the types of situations that warrant the application of financial knowledge.

Another financial literacy measurement was developed by Ciemleja et al. (2014) which was designed specifically to measure the financial literacy of Latvia citizens. Their definition included financial knowledge, financial skills, and financial behavior (Ciemleja et al., 2014). A separate tool was developed because existing tools were considered neither sufficient nor directly applicable specifically to the Latvian economy by the researchers, and the researchers also deemed it as too heavily focused on numeracy

(Ciemleja et al., 2014). Ciemleja, Lace, and Titko's (2014) financial literacy measurement tool was a short 12-question survey designed to measure six factors: saving and borrowing, investments, personal budgeting, financial concepts, economic issues, and financial services.

Lusardi and Mitchell developed a set of three questions that have been used to measure financial literacy in various studies (FINRA Investor Education Foundation, 2013, 2016a; Lusardi & Mitchell; 2011a; Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014; Potrich et al., 2016; Schuhen & Schürkmann, 2014). Lusardi and Mitchell's (2011a) questions were as follows:

1. Understanding of Interest Rate (Numeracy). Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

(i) More than $102

(ii) Exactly $102

(iii) Less than $102

(iv) Do not know

(v) Refuse to answer

2. Understanding of Inflation. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

(i) More than today

(ii) Exactly the same

(iii) Less than today

(iv) Do not know

(v) Refuse to answer

3. Understanding of Risk Diversification. Please tell me whether this statement is true or false. 'Buying a single company's stock usually provides a safer return than a stock mutual fund'.

(i) True

(ii) False

(iii) Do not know

(iv) Refuse to answer (p. 511-512)

The topics covered in these questions regard numeracy through interest rates, inflation and risk diversification (Lusardi & Mitchell, 2014; Potrich et al., 2016). Potrich et al. (2016) explained that the value in this survey was its widespread use throughout various surveys. These three questions developed by Lusardi and Mitchell (2011a) have been used in other studies. According to Lusardi and Mitchell (2014) the questions were first used in the 2004 Health and Retirement Study, and have since been used in various studies, such as 2007-2008 National Longitudinal Survey of Youth, RAND American Life Panel, and the 2009/2012/2015 National Financial Capability Study.

The National Financial Capability Study was one example of a survey that employs Lusardi and Mitchell's three questions (FINRA Investor Education Foundation, 2016a). The global use of these questions was the reason for choosing them for this study (Lusardi & Mitchell, 2011b). In addition, other studies have indirectly used the Lusardi

and Mitchell questions by employing data from the National Financial Capability Study (Allgood & Walsted, 2013; Babiarz & Robb, 2014).

The financial literacy portion of the National Financial Capability Study Survey was the chosen instrument used to obtain the financial literacy data for this study (FINRA Investor Education Foundation, 2016a). The National Financial Capability Study Survey has been conducted three times, in 2009, 2012, and 2015 (FINRA Investor Education Foundation, 2016a). The National Financial Capability Study Survey provides several levels of financial literacy data (FINRA Investor Education Foundation, 2016a). The data was collected at levels including national, state level, and military. The national data provides a source for this study.

This survey was an ongoing effort and measures four aspects of financial literacy: (1) "making ends meet," (2) "planning ahead", (3) "managing financial products", and (4) "financial knowledge and decision-making" (FINRA Investor Education Foundation, 2016a, p. 3). There are plans to continue disseminating this survey to continue tracking financial literacy. This survey utilized Lusardi and Mitchell's (2011a) three questions and three additional questions. The additional questions on the National Financial Capability Study are as follows FINRA Investor Education Foundation (2016a):

1. Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

(i) More than $102

(ii) Exactly $102

(iii) Less than $102

(iv) Don't know

(v) Prefer not to say

2. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

(i) More than today

(ii) Exactly the same

(iii) Less than today

(iv) Don't know

(v) Prefer not to say

3. If interest rates rise, what will typically happen to bond prices?

(i) They will rise

(ii) They will fall

(iii) They will stay the same

The National Financial Capability Study survey was initially designed to obtain a baseline level of financial literacy for American adults (Allgood & Walsted, 2013). The availability of a baseline level of financial literacy for American adults was one reason for choosing this survey for obtaining the baseline data for comparison with the rest of the United States.

Other studies have utilized the National Financial Capability Study data in their research studies. Allgood and Walsted (2013) also employed data from the National

Financial Capability Study Survey to study objective and subjective financial literacy as it applies to credit card behavior; they cited the initial survey from 2009. The relative newness of the study of financial literacy and lack of a universal financial literacy measurement tool lead to a lack of multiple studies to report coefficients from to access the reliability of the study. Babiarz and Robb (2014) also used preexisting National Financial Capability Study data to conduct their study of whether more financially literate individuals had a better understanding of their own need for emergency savings as compare to those with less financial literacy. Robb et al. Seay (2015) utilized the 2009 and 2012 National Financial Capability Study data to study the relationship between subjective and objective financial knowledge and the use of alternative financial services, such as pay day loans. Their results were threefold. Overconfident individuals with low objective knowledge were more likely to use alternative financial services, individuals with high objective knowledge tended toward less risky behavior, and under certain conditions individuals with subjective knowledge tended to use alternative financial services (Robb et al., 2015).

Methodology

Douglas and Walker (2012) explained that the Appalachian region has been a research focus because of the opportunity to use the region to study poverty. This research then can be extended to other regions characterized as being in poverty. For instance, regression analysis has been used to study variables associated with poverty as well as income growth in this region (Douglas & Walker, 2012). Douglas and Walker suggest homogeneity in the sample to avoid bias in research in the region (Douglas &

Walker, 2012). They accomplished this through the creation of an algorithm for sample selection based on three variables.

Summary and Conclusions

The focus of Chapter 2 was a review of the existing literature related to financial literacy, key financial indicators, and the Appalachian Kentucky region. First, the justification for conducting this study from a human capital theory perspective was discussed and justified. Next, the literature review was presented. The Appalachian region and its characteristics were discussed, including the continued poor economic state of the region as it relates to the three key financial indicators. There is a continued issue with low financial literacy in the American as well as other populations according to the current literature. Finally, I presented a literature review focused on existing financial literacy measurement tools, specifically of using the National Financial Capability Study.

This study intended to fill the existing gap in the literature regarding the financial literacy level of the Appalachian Kentucky population and any relationships between the key financial indicators and the financial literacy level of this population. This gap was intended to be filled through this study utilizing primary and secondary data that will be collected through a quantitative, cross-sectional design as described in Chapter 3.

Chapter 3: Research Method

The purpose of this quantitative, nonexperimental study was to determine the level of financial literacy for residents of Appalachian Kentucky, as well as compare it to the financial literacy of the residents of the entire United States. This study produced baseline information for use in future research. Such information could be useful in understanding financial literacy needs and improving financial literacy initiatives and opportunities, in Appalachian Kentucky if a need is ever determined. The initiation of this study could help to encourage maintenance of a more educated employee pool where outmigration of educated citizens has been previously noted by other researchers (Gebremariam et al., 2011; Ludke & Obermiller, 2014). This is related to the potential that this study has to improve the key financial indicators (poverty, unemployment, and personal income) in the region.

In this chapter, I present an introduction to the research method for meeting the purpose of this study. Included in this chapter is a discussion on the methodology including the population and sample; procedures for sampling, recruitment, participation, and data collection; archival data; and instrumentation and operationalization of constructs. A pilot study or intervention will not apply to this study. I also discuss the data analysis plan and threats to validity for this study.

Research Design and Rationale

This research study was quantitative, utilizing a nonexperimental survey (cross-sectional) research design. The independent variable for this study was residency location, and the dependent variable was the level of financial literacy. The residency

location could assume two possible values. These possible values were Appalachian Kentucky or the United States.

This design choice was consistent with existing research that has advanced related knowledge. Other researchers have utilized this design successfully in related research (Allgood & Walsted, 2013; Robb et al., 2015). Allgood and Walsted (2013) used the cross-sectional research design to show that subjective financial literacy was a predictor of certain credit card behaviors, including payment timing and payment amounts. Robb et al. (2015) used cross-sectional data to determine the relationships between subjective knowledge, objective knowledge, and alternative financial services.

The reason for choosing a survey design are many. It is important for research to be replicable, and the survey design allows this important option (Rea & Parker, 2014). The survey design allows the researcher to generalize from samples to populations; the size of the population in this study makes this a valuable attribute of the survey research design (Rea & Parker, 2014). A survey was a necessary choice for the tool to measure the financial literacy of Appalachian Kentuckians. The particular survey choice was because Lusardi and Mitchell's (2011a) questions have been employed successfully by other studies, and hence, the survey provided more merit to the study (Lusardi & Mitchell; 2011a; Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014; Potrich et al., 2016; Schuhen & Schürkmann, 2014).

The use of a survey was necessary for administering a financial literacy measurement tool for this study. A pre-existing tool was utilized, as discussed later in this chapter, rather than having created a new one. SurveyMonkey was the chosen method for

administering this survey. The choice of this internet platform was to simplify data analysis steps, as it reduces the need for inputting the data from a paper survey, for example. Computers and tablets were provided at the survey site for participants to use to complete the survey.

There are both advantages and disadvantages to the choice to use a survey. This methodology was deemed promising because it can be tailored to better fit all participants' schedules and can be made available for an interval of time; potentially improve accuracy by reducing data entry errors; and provide the ability to regularly communicate with participants (Chang & Vowles, 2013). A disadvantage is that the use of an online survey has the potential to limit the participants of the study because of the need for internet access and the ability to sufficiently use the internet (Chang & Vowles, 2013). Internet accessibility could be a significant problem since Appalachian Kentucky has the highest poverty rate in Appalachia according to the Appalachian Regional Commission (2015), hence a percentage of the population may not be able to afford home internet access.

Methodology

In this section, I present the details of the research methodology. Appalachian Kentuckian adults aged 18 years or older made up the population for this study. It was not feasible to obtain financial literacy data from the over 1.1 million individuals who make up this population, so a sample was collected (Appalachian Regional Commission, n.d.b). I present further detail on the population and sampling procedures in this section. Recruitment procedures are also outlined in detail in this section.

Population

The population for this study was Appalachian Kentuckian adults aged 18 years or older. Appalachian Kentucky was defined based on the Appalachian Regional Commission (n.d.a) definition. This definition included 54 of the 120 counties in Kentucky, which encompass nearly the entire eastern half of the state (Appalachian Regional Commission, n.d.a). The counties are found in alphabetical order in Appendix B. According to the Appalachian Regional Commission (n.d.b), the Appalachian Kentucky population on April 1, 2010 was 1,184,278; residents of Appalachian Kentucky represented the target population for this study.

Sampling and Sampling Procedures

The sampling frame for this study consisted of all current Appalachian Kentuckian residents. The sample was chosen from an Appalachian Kentucky county that was determined to be the mathematically average representative county for Appalachian Kentucky. The average was based on the three key financial indicators and was determined using appropriate methods of linear algebra, as described in the next section. The key financial indicators used for this calculation were poverty rates, unemployment rates, and personal income rates for each county in Appalachian Kentucky. Appendix A shows these three rates for all Appalachian Kentucky counties, the population of each county, and their corresponding average.

Sample Selection

Two methods were used to determine the most average county according to the three financial indicators: poverty rate, per capita income, and unemployment rate. Using

these three financial indicators, a vector was used to represent each county. First, it is important to note that these three variables employ different units of measure, and hence, cannot be directly compared. Standardizing (calculating *z*-scores) the values of the three key financial indicators was necessary. To standardize the values, the *z*-score was calculated for each county, per financial indicator, as seen in Appendix C. For example, direct comparison between poverty rates and per capita incomes was not reasonable because one is a percentage and the other is a dollar amount. To account for this, the data values for all three variables were standardized, and the *z*-scores replaced raw data values in determining the county to sample.

The choice of each method was a result of the ability of the method to measure Euclidean distance between vectors. The two methods are called the minimum length and the geometric median. The choice of each method was because of their ability to measure Euclidean distance between vectors. A description of each method follows the explanation of the L^2 Norm.

L2 norm. The L^2 norm measures the length of a vector. It was useful here to compare the lengths of the vectors to determine the smallest Euclidean distance between pairs of vectors (Tamandani, Bokhari, & Kord; 2016). More specifically, measuring and comparing the distance between vectors representing the three variables was used to determine the most average county for sampling. Let $\boldsymbol{u} = (x_1, y_1, z_1)$ and $\boldsymbol{v} = (x_2, y_2, z_2)$. Then, the L^2 norm is defined as

$$\|u\|_2 = \sqrt{x_1{}^2 + y_1{}^2 + z_1{}^2}$$

Since the distance between the vectors is found by taking the difference of the coordinates, the distance between vectors ***u*** and ***v*** is then

$$\|u - v\|_2 = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

(Kolman & Hill, 2000).

The 54 Appalachian Kentucky counties were organized in alphabetical order (see Appendix B). For i = 1, 2, …,54, let x_i be the z-score poverty rate for the i^{th} Appalachian Kentucky county, y_i be the z-score per capita income for the i^{th} county, and z_i be the z-score unemployment rate for the i^{th} county. Let μ be the mean vector, μ_x be the mean poverty rate for all Appalachian Kentucky counties, μ_y be the mean per capita income for all Appalachian Kentucky counties, and μ_z be the mean poverty rate for all Appalachian Kentucky counties. Then $\boldsymbol{\mu} = (\mu_x, \mu_y, \mu_z)$ = (26.7%, $28,910, 9.13%). However, the use of z-scores produces a mean and standard deviation for each of these variables, by definition, of zero and one, respectively. That is, $\mu_x = \mu_y = \mu_z = 0$, and (0, 0, 0) was then the mean vector for the standardized values.

Method 1: Minimum length. The L^2 Norm was chosen because it can directly calculate the Euclidean distance between vectors and hence be used to determine the minimum distance (Kolman & Hill, 2000). Here it was necessary to calculate the Euclidean distance between the vectors representing each county and the mean vector for all counties. The mean vector was the vector that consists of the means for each of the three variables. Then the county with the minimum distance from the mean was labeled the most average county.

The L^2 norm was used to calculate the Euclidean distance between each value and its corresponding mean per county. The Euclidean distance represented the distance between the $\boldsymbol{u} = (x_i, y_i, z_i)$ and $\boldsymbol{\mu_u} = (\mu_x, \mu_y, \mu_z)$. The most average county was then the county that was the minimum Euclidean distance between these two vectors. However, since $(\mu_x, \mu_y, \mu_z) = (0, 0, 0)$, this represented the Euclidean distance to the origin. The norm was calculated by:

$$\sqrt{(x_i - \mu_x)^2 + \left(y_i - \mu_y\right)^2 + (z_i - \mu_z)^2}$$

$$=\sqrt{(x_i - 0)^2 + (y_i - 0)^2 + (z_i - 0)^2}$$

$$= \sqrt{{x_i}^2 + {y_i}^2 + {z_i}^2}$$

for $i = 1, 2, \ldots, 54$.

Microsoft Excel was chosen to calculate these matrix of Euclidean distances, and the individual norms. The minimum norm was approximately 0.23481, which was the norm for the average Appalachian Kentucky county.

Method 2: Geometric median. The geometric median minimizes the distances to all the points for a countable quantity of points (Tamandani et al.; 2016). That is, it can be used to determine the optimal position the distance from all the points to the geometric median. This method has been used to minimize distances in a similar manner in other studies. Tamandani et al. (2016) used the geometric median to minimize the distance from to obtain the optimal location for a sink node in relation to all the other nodes for the best overall performance of a wireless sensor network.

The geometric median method applies the L^2 norm. The geometric median method was used to compare all combinations of counties. Then the norm for all the combinations of the counties as pairs were calculated by

$$\sqrt{(x_i - x_j)^2 + (y_i - y_j)^2 + (z_i - z_j)^2},$$

where i = 1, 2, …, 54 and j = 1, 2, …, 54. That is, row one (column one) represented the Euclidean distance between Adair County (-1.1570, -0.8241, -0.4105) and each of the counties. Since there were 54 counties represented in Appalachian Kentucky, a 54 x 54 matrix was used to represent these Euclidean distances to make the calculation, found in Appendix C. The diagonal of the matrix was all zeros since the diagonal represented the Euclidean distance between a county and itself. Next, each row (or column) was summed, and then the location of the minimum sum was the geometric median (Tamandani et al., 2016). Finally, the geometric median was considered the "most average" county. The geometric median for the average Appalachian Kentucky county was determined to have a minimum value of 83.1777.

Both the minimum length and geometric median methods yielded the same results; that is, both produced the same county that was considered the average county according to the poverty rate, per capita income, and unemployment rate, and this methodology. Reassurance was seen in the comparison of the vector for the average county (26.70%, $28,128, 9.00%) and μ (26.7%, $28,910, 9.13%). In addition, the z-scores showed that the average county was 0.0215, -0.2244, and -0.0657 standard deviations from the mean poverty rate, per capita income, and unemployment rate, respectively. Two different methods provided the same results, which justified the choice

of sampling the county in Appalachian Kentucky as the most average county in terms of poverty rate, per capita income, and unemployment rate.

The National Financial Capability Study Survey was the chosen instrument for obtaining the financial literacy data in this study (FINRA Investor Education Foundation, 2016a). There were concerns that the entire National Financial Capability Study was too lengthy for the purpose of this study and may have deterred participation. However, the survey was useful because of its inclusion of the demographic and financial literacy questions necessary to this study. This version also had one question added regarding residence of the participant to ensure that Appalachian Kentuckians were surveyed; specifically, participants were asked to provide their zip code of residence. In addition, the National Financial Capability Study Survey provided several levels of financial literacy data. The data was collected using the National Financial Capability Study at levels including national, state, and military. The national data provided a promising source for this study.

For this study, the multi-stage sampling method was the chosen sample selection method for this study. An average of each of the three key financial indicators (poverty, unemployment, and personal income) was determined for the entire Appalachian Kentucky region through the Appalachian Regional Commission's (2015) data reports. Next, I used a mathematical model to determine a representative average of the three key financial indicators. A mathematically average county was chosen based on these indicators as a representation of the Appalachian Kentucky region to obtain the sample.

The sample selection procedure is an important aspect of any research study. However, selection of the sample cannot be completed without a predetermined, scientifically founded sample size. Three of the four components necessary to sample size determination must be predetermined and used to determine the fourth component; the four components are the sample size, the effect size, α-level, and power (Bjorn, 2013; Brand, Bradley, Best, & Stoica, 2011; Martinez-Mesa, González-Chica, Bastos, Bonamigo, & Duquia, 2014; Trochim, 2006). An alpha level of 0.05 and power of 80% are typical to social science research and were used in this study (Brand, et. al, 2011; Martinez-Mesa, et. al, 2014; Trochim, 2006). An alpha level of 0.05 indicated that there is a 0.05 probably of obtaining statistically significant results (Brand, et. al, 2011). The 80% power means that the probability of predicting the effect was 0.80 (Martinez-Mesa, et. al, 2014; Trochim, 2006).

To test the first research question, a *t* test for finding the difference between the mean and a constant was utilized. The established mean was used for the national financial literacy level; hence a constant was used for the mean. This determined whether there was a difference (two-tails) between the national mean and the Appalachian Kentucky mean. Using GPower 3.1.9.2 the appropriate sample size for this study was identified as $n = 34$ at a power of 80% as described above, an alpha level of 0.05, and a medium effect size of 0.50, for a two-tailed *t* test of the difference between a mean and a constant (Faul, Erdfelder, Buchner, & Lang, 2009).

Testing the second research question required the use of multiple linear regression. The relationship between the dependent variable, Appalachian Kentucky

Financial Literacy Rates, and the independent variables, the three key financial indicators, was determined through a multiple linear regression model. In addition, interaction effects between the dependent variables were identified through the use of multiplicative coefficients.

Prior to conducting the data analysis, it was necessary to address the assumptions for the statistical test. There are specific assumptions that must be met when a multiple linear regression is used for the analysis of the relationship between one dependent variable and multiple independent variables. The first assumption is that there must be a linear relationship between the independent and dependent variables (Gregoire, 2014). The second assumption requires the residuals, or errors, to be normally distributed (Gregoire, 2014). Third, perfect multicollinearity cannot exist in the data; that is, the independent variables cannot be perfectly correlated with each other (Field, 2013; Gregoire, 2014). The fourth assumption is that there is homoscedasticity; that is, the variances across the independent variables are homogenous (Gregoire, 2014). A discussion on meeting the assumptions of multiple linear regression are to be discussed in Chapter 4.

Procedures for Recruitment, Participation, and Data Collection (Primary Data)

The sample was selected in the identified county because of the averageness of the county as described previously. Further, the selection of the sample contained a convenience component. Data collection required about three computers and tablets made available at a popular local area where social gathering of citizens was expected. The sampling location was also chosen because the location offered a diverse selection of

people as potential participants. Choices included a Wal-Mart, community center, or county event such as a fair or festival depending on the time of year that the data was collected. The specific location was not identified for anonymity purposes.

After the location was determined, I obtained use of several computers for collection of the data. At the location, I used an area, where two-to-three people could complete the survey using the provided computers/tablets at a time. I recruited, screened, and administered the financial literacy survey. Recruitment was of willing participants. To entice participants, those who qualified for participation and participated received a gift card as a thank you for their time and cooperation. The participants were offered their choice of a $10 Subway or McDonald's restaurant gift card. Those willing participants had to qualify for inclusion through a short set of screener questions; the main recruiting requirement was that the participant be a citizen of the Appalachian Kentucky sampling county region. I was available to assist with the logistics of completing the financial literacy survey. For example, I offered to help with computer usage and reading when necessary.

Prior to completing the survey, the research study was explained to the participants, and the willing participants were given a copy of the informed consent document. They were asked to read the informed consent document. I was available to answer questions regarding the informed consent as well as questions about the research. I also offered to read the document to the participants.

The demographic portion of the survey consisted of necessary and relevant information, as this is part of the National Financial Capability Study (FINRA Investor

Education Foundation, 2016a). As previously stated, it was necessary to choose participants that were residents of Appalachian Kentucky by residing in the sample selection region. Residency was verified with screener questions. Further, the specific county and city residency was included for further verification. It is possible that a participant may be from a location other than the sampled average county. In addition, age, gender, ethnicity, employment status, level of education, student status, personal income, military status, retirement status, household financial knowledge status, and marital status information was requested in the demographic part of the survey. All of these variables were not necessary for making statistical conclusions, but was useful in classification, organization, and toward future research.

After completion of the survey, the participants were debriefed. The participants were informed before participating in the study of the purpose of the study, and how the data would be used. Participants were reminded that their personal contact information was not stored within the study data. I offered to answer any remaining questions the participants had. There was no further need to contact the participants after the data was collected.

Archival Data

The National Financial Capability Study was a survey that aimed to measure the financial capability, including financial literacy, of Americans (FINRA Investor Education Foundation, 2016a). The study was a joint effort of the United States Department of the Treasury and the President's Advisory Council on Financial Capability (O'Neill & Xiao, 2015). The National Financial Capability Study was collected at the

national, state, and military levels throughout the years 2009, 2012, and 2015 (FINRA Investor Education Foundation, 2016a). It included a financial literacy section comprised of Lusardi and Mitchell's financial literacy assessment questions (FINRA Investor Education Foundation, 2016a; Lusardi & Mitchell, 2011a). The dataset for all levels of the National Financial Capability Study, including the survey, are readily available on the FINRA Investor Education foundation website. I also requested permission from the FINRA Investor Education Foundation to use the data in this study to ensure permission was clear. The national data from the National Financial Capability Study was used for the comparison to the collected Appalachian Kentucky data.

The National Financial Capability Study included the Lusardi and Mitchell financial literacy questions in the financial literacy portion of the survey (FINRA Investor Education Foundation, 2016a; Lusardi & Mitchell, 2011a). These questions have been used with success as part of the National Financial Capability Study and other surveys used to measure financial literacy (Lusardi & Mitchell; 2011a; Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014; Potrich et al., 2016a; Schuhen & Schürkmann, 2014). The use of these questions across different studies gave credibility to this study, specifically the decision to use the National Financial Capability Study survey itself and its national data.

The data for the three key financial indicators from Appalachian Kentucky was taken from the Appalachian Regional Commission's data banks. The Appalachian Regional Commission is a respected governmental agency developed by President Lyndon B. Johnson in 1964; it is dedicated to the plight and needs of the Appalachian

region and its people (Douglas & Walker, 2012; Thorne et al., 2004). The Appalachian Regional Commission was chosen because it is a governmental agency, and governmental agencies provide the most reliable sources for secondary data. The most recent data from this agency was employed in this study. The data is open access and is readily available on the Appalachian Regional Commission's website. A disadvantage to using governmental data could be the age of the data. Governmental data is collected slowly, often because of the large quantity of data collected and the many processes and approvals necessary for collecting governmental data.

Instrumentation and Operationalization of Constructs

The instrument chosen for use in this study is called the 2015 National Financial Capability Study State-by-State Survey Instrument developed by FINRA Investor Education Foundation (2016a). This instrument choice was relevant because of the ability to use preexisting data collected from the 2015 study to be used as the national financial literacy levels. These levels were relevant to the study because of the purpose of this study was to compare national and Appalachian Kentucky financial literacy levels.

The National Financial Capability Study collected data at three different points in time, 2009, 2012, and 2015 (FINRA Investor Education Foundation, 2016a). Three populations were considered in the National Financial Capability Study, as data was collected at levels including national level, state level, and military level. The various levels of collection offered many options of comparison with collected data, as well as in future research.

Reliability is an important aspect of research to ensure that the data were analyzed correctly (Lucey, 2005). One indicator of a reliable study is that the study can be repeated with the same results being obtained (Lucey, 2005). This study used the existing Lusardi and Mitchell questions within the National Financial Capability Study. This choice demonstrated the reliability of the study through replicability. The choice of this study and clear explanation of the recruitment methods would allow another researcher to replicate this study easily. Several studies have used the Lusardi and Mitchell questions to successfully measure financial literacy in various populations (FINRA Investor Education Foundation, 2013, 2016a; Lusardi & Mitchell; 2011a; Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014; Potrich et al., 2016; Schuhen & Schürkmann, 2014). Lusardi and Mitchell have clearly established the concepts measured using their three questions (Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014; Schuhen & Schürkmann, 2014). They measure "understanding of interest rates (numeracy)," "understanding of inflation," and "understanding of risk diversification" (Lusardi & Mitchell, 2011a, p. 511-512). The questions were designed to concisely and effectively measure basic financial literacy (Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014; Schuhen & Schürkmann, 2014).

The instrument, the National Financial Capability Study, was sufficient for answering the research questions. The National Financial Capability Study has been used to measure financial literacy for American population in previous studies (FINRA Investor Education Foundation, 2013, 2016a). Collecting data specific to the Appalachian

Kentucky population allowed an easy comparison by using previously used National Financial Capability Study.

Data Analysis Plan

The two research questions as stated in Chapter 1 are included here. Included also are the corresponding hypotheses for each of those research questions. In this section I begin to address the data analysis plan for answering these questions.

RQ1: What is the degree to which the levels of financial literacy between Appalachian Kentuckians and Americans differ?

$H_0$1: There is no significant difference between the mean levels of financial literacy of Appalachian Kentuckians and Americans.

H_a1: There is a significant difference between the mean levels of financial literacy of Appalachian Kentuckians and Americans.

RQ2: What is the relationship between the financial literacy level of Appalachian Kentuckians and the Appalachian Kentucky poverty, unemployment, and personal income rates?

$H_0$2: The Appalachian Kentucky financial literacy rate is not affected by the Appalachian Kentucky poverty, unemployment, or personal income rates.

H_a2: The Appalachian Kentucky financial literacy rate is affected by at least one of the variables Appalachian Kentucky poverty, unemployment, or personal income rates.

This study was quantitative and nonexperimental, which promoted the use of quantitative analysis software. The software chosen for the analyses in this study is

PASW Statistics, formerly named IBM SPSS. This software has many advantages in quantitative research. The software is widely used so other data is often in the file format useful in SPSS/PASW. Spreadsheet formats, such as MS Excel spreadsheets, are easily and quickly uploaded within the SPSS/PASW software. Specific to this study, the National Financial Capability Study data was already compatible with the software for easy comparison to the data that was collected for this study.

This study aimed to produce baseline data for the financial literacy level of Appalachian Kentuckians. After collecting the financial literacy data through the National Financial Capability Study, descriptive statistics were calculated from the data. Key statistics included consisted of statistics of the financial literacy level such as the mean, median, mode, variance, and standard deviation.

Screening and Cleaning Data

Data had to be cleaned and screened before analysis. This occurred when the data was prepared for analysis. Screening required the confirmation that all individuals in the sample were members of the population, based on age and county of residence. Individuals with missing data values were omitted from the sample in their entirety. That is, if an individual failed to answer any of questions necessary to analysis, then his or her responses were omitted from the sample; the necessary questions included some demographic questions and financial literacy questions.

Another step to cleaning and screening the data included transforming variables and calculating new variables based on the sample data. In this step, individual responses from the survey were converted to new variables as necessary to obtain values to be used

to answer the research questions. For instance, the transformation of variables included creating a variable for the group midpoint to represent the annual household income. The ninth survey question offered individuals intervals or groups to choose from to report their annual household income. The intervals that made up the answer choices for this question can be found in Appendix F. Calculation of new variables included creating a variable for poverty based on whether an individual was in the poverty threshold or not (U.S. Census Bureau, 2017a; U.S. Census Bureau, 2017b). Determination of the poverty threshold required data from the responses to the annual household income and household size survey questions (U.S. Census Bureau, 2017a).

The poverty threshold was obtained based on the methodology of the United States Census Bureau (2017a; 2017b). Deaton & Niaman (2012) explain that the United States Census calculates poverty based on family size and income. Partridge et al. (2012) and the Appalachian Regional Commission (2016a) both used the United States Census Bureau method to calculate poverty level. To determine whether a household was in poverty, the United States Census Bureau (2017a) used a poverty threshold based on the number of adults and children in a household.

The United States Census Bureau's (2017a; 2017b) definition was that "poverty threshold weighted average by household size" was used to determine the poverty threshold for a household based on household size. These values provided by the United States Census Bureau utilized the minimum income required to sustain a household based on the number of members in the household (United States Census Bureau, 2017a). These values are found in table 2. The transform data function in SPSS was used to

recode the existing data into a new variable. If the household income was greater than or equal to the poverty threshold then the household was not classified as in poverty, and if the household income was less than the poverty threshold then the household was classified to be in poverty, according to the United States Census Bureau's (2017a) definition. Finally, the "Poverty" variable was created using SPSS as a binary variable where "0" represented "a household not in poverty" and "1" represented "a household in poverty." The United States Census Bureau (2017a) also analyzed the household's poverty status by reviewing the ratio of income to poverty (the income divided by the poverty threshold) and the income deficit (the difference between the income and the poverty threshold).

Table 2

United States Census Bureau Poverty Threshold Weighted Average by Household Size

Household size response	United States Census Bureau poverty threshold weighted average
1	$12,228
2	$15,569
3	$19,105
4	$24,563
5	$29,111
6	$32,928
System missing	System missing

This table offers the poverty threshold weighted average by household size. The values are the guidelines of the U.S. Census Bureau's (2017b).

Analysis of Research Questions

The two research questions in this study were statistically analyzed using different tests. The first research question to determine degree to which the levels of financial literacy between Appalachian Kentuckians and Americans differ was answered using a *t* test. A *t* test was necessary to determine the difference between the mean levels of financial literacy for both populations. The mean level of financial literacy for Americans was based on the constant value that the National Financial Capability Study collected as the financial literacy level in terms of the average number of correct questions on the financial literacy portion of the survey. The average number of correct questions was converted to a percentage score by dividing the average number of correct questions by six (the number of financial literacy questions on the National Financial Capability Study). This defines the level of financial literacy for Americans for this study. The level of financial literacy for Appalachian Kentuckians was calculated in the same manner. Mathematically, this percentage could be any number between 0% and 100% since the average number of correct questions can be any real number in the interval from 0 to 100% inclusive. The interpretation of the results included key parameter estimates based on sample data, and confidence intervals for the mean Appalachian Kentuckian level of financial literacy was be reported.

The second research question was to determine the relationship between the financial literacy level of Appalachian Kentuckians and the Appalachian Kentucky poverty, unemployment, and personal income rates (key financial indicators). The data for the key financial indicators came from data collected by the Appalachian Regional

Commission. The key financial indicators were analyzed through hypotheses that require the use of multiple linear regression. The linear correlation coefficient was used to determine whether a linear relationship exists between the Appalachian Kentuckian financial literacy level and each of the three key financial indicators. The level of financial literacy was calculated as described previously. The three key financial indicator values were based on the data values reported by the Appalachian Regional Commission. Each key financial indicator used was based on a comparison with national values, the unemployment rate as a percent of United States average, per capita income as a percent of the United States average, and poverty rate as a percent of United States average (Appalachian Regional Commission, 2016b, 2016d, 2016c).

Threats to Validity

Assessment of the validity of a study is necessary to ensuring the methodology used in the study was appropriate (Lucy, 2005; Schuhen & Schürkmann, 2014). The design and methodology should be considered in terms of validity. Three types of validity in terms of this study, including external, internal, and construct validity, are discussed in this section, as well as ethical procedures.

External Validity

The threats to external validity come from external sources. One threat may come from the sample selection site. Though participants were offered an incentive to participate in the study, they may have been distracted by their surroundings. This may have come from distractions in the form of the environment or distractions in the form of

a disruption in their goals for being at the site. These distractions could have affected their concentration while answering the questions from the survey.

Internal Validity

The internal validity of the study considers threats relating to the research design. The use of the National Financial Capability Study for both primary and secondary data may be of concern since the two data sets to be compared will be collected at different points in time. Another threat to the internal validity is the sample used to represent the Appalachian Kentuckian population. The sample came from a single county per the mathematical foundation previously discussed. The use of the L_2-Norm and Geometric median corroborated the choice by offering the same county as being average with both methods. Confounding could also be an issue related to the internal validity of this study. Confounding occurs when there are other variables that are related to the independent study that were not considered in the study. This study considered whether there was a linear relationship between the financial literacy level of Appalachian Kentuckians and the three key financial indicators.

Construct Validity

As discussed in Chapter 2, there is a lack of an existing universal measurement tool for financial literacy (Ciemleja et al., 2014; Huston, 2010; Knoll & Houts, 2012; Potrich et al., 2016). This made the choice of a measurement tool more difficult and could have caused construct validity issues for this study (Schuhen & Schürkmann, 2014). Construct validity was necessary in order to ensure that the statistical conclusions were valid, and the construct that was intended to be measured was actually measured

(Schuhen & Schürkmann, 2014). In this case, it was necessary to demonstrate that the National Financial Capability Study was a valid measure of financial literacy. Schuhen and Schürkmann (2014) explained that sometimes it is difficult to determine whether a survey is in fact measuring financial literacy or if it is inadvertently measuring mathematics, for instance. Schuhen and Schürkmann explained that the Lusardi and Mitchell questions are able to measure financial literacy through brief and easy to understand questions, as was claimed by Lusardi and Mitchell regarding their three questions (Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014; Schuhen & Schürkmann, 2014). The questions are not complex in terms of concepts necessary to advanced financial literacy but were developed to measure basic elements of financial literacy (Lusardi & Mitchell, 2011b). The questions developed by Lusardi and Mitchell were simple, brief, and easy to understand, making them useful measurements for determining an individual's financial literacy (Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014; Schuhen & Schürkmann, 2014).

The National Financial Capability Study was the chosen measurement of financial literacy employed in this study included questions developed by Lusardi and Mitchell (Lusardi & Mitchell; 2011a; Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014). The Lusardi and Mitchell (2011a) questions made up the financial literacy portion of the National Financial Capability Study. The successful use of these questions within other studies was an indication that the questions are measuring financial literacy (Lusardi & Mitchell; 2011a; Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014; Potrich et al.,

2016; Schuhen & Schürkmann, 2014). The reinforcement that the widespread use offers toward construct validity for this measurement tool was the main reason for this choice.

Ethical Procedures

Consideration of permissions related to collecting data for this study was necessary. First, the use of human participants required IRB approval (approval #10-27-17-0417838). Second, was also necessary to obtain permission from the data collection site; for example, if the collection site was at a Wal-Mart, it would have been necessary to obtain written permission from the store before travelling to collect the data. Finally, for the archival data, permission to use the data collected by the National Financial Capability Study was obtained even though the data is readily available on the website.

Incentives were used to entice participation in the study. In addition, the incentive was used to account for the time that the participant used to complete the study. Without incentives, it may have been difficult to recruit participants.

The participants were made aware of the purpose of the study, uses of the data, and use of personal information in advance of participation. The data collected was anonymous, whereas, names and contact information of the participants was not collected with the financial literacy survey. Data was stored on a cloud server that is password protected. Data obtained from the Appalachian Regional Commission and from the National Financial Capability Study were already in an anonymous format. This study was not an experiment, it was not an intervention, nor did it use deception in any way, so there were no major ethical concerns relating to collecting data for this study.

Summary

This third chapter of this research study has explained how this quantitative, nonexperimental survey (cross-sectional) research designed study was conducted. This study utilized both primary and secondary data. The secondary data was taken from the FINRA Investor Education Foundation's National Financial Capability study. The secondary data was collected based on a mathematically average county from Appalachian Kentucky to represent the population. The primary data described in the results section of Chapter 4 was collected using the National Financial Capability Study.

Chapter 4: Results

A comparison between the level of financial literacy for residents of Appalachian Kentucky and the residents of the entire United States was the purpose of this quantitative, nonexperimental research study. However, there were two research questions for this study. The focus of the first research question was to determine the degree to which the levels of financial literacy between Appalachian Kentuckians and Americans differ. The corresponding hypotheses were to determine whether or not there is a significant difference between the mean level of financial literacy of Appalachian Kentuckians and the constant value representing the financial literacy level of Americans. The second research question was to determine what relationship existed between the financial literacy level of Appalachian Kentuckians and the three key financial indicators: the Appalachian Kentucky poverty, unemployment, and personal income rates. The hypotheses for this research question was to determine whether or not the Appalachian Kentucky financial literacy rate was affected by the Appalachian Kentucky poverty, unemployment, or personal income rates.

In Chapter 4 I focus on three main areas: the data collection, study results, and summary. First, I discuss the data collection time frame, recruitment, and response rates and provide both descriptive and demographic characteristics of the sample. Next, I offer sample-characterizing descriptive statistics, evaluation of statistical assumptions, and statistical analysis findings. Finally, the answers to the research questions are presented in the summary section.

Data Collection

I collected the data for this survey using the National Financial Capability Study survey (FINRA Investor Education Foundation, 2016a). Participants were recruited in person and allowed to complete the survey using provided computers and tablets. The survey was administered via SurveyMonkey. Potential participants were receptive to my request to complete the survey. A few errors occurred where participants were not able to complete the survey. Any participant who began the survey was given the gift card even if all responses were not able to be used. The power analysis determined that a sample of size 34 was necessary. The actual sample contained 45 total responses; however, nine had to be omitted either due to ineligibility or incompleteness. A complete explanation of the omitted responses is provided below. This resulted in 36 individuals' responses that I could use in the final data analysis. This is equivalent to 80% of the individuals surveyed.

The data collection process went smoothly, and I had positive responses when I approached potential participants. The time frame for data collection was four days. A few people were too busy to complete the survey; over all, I was pleased there were no negative responses. I failed to count the number of potential participants that I approached. An exact response rate is not available; 75% would be a generous response rate approximation. The data collection process was a positive experience, where I quickly obtained slightly more than the minimum sample size.

As a further explanation of the response rate, there were some participants' data that were not used in the final analysis. There were two reasons for this. First, there were three instances of participants completing the survey who were not from the sample

frame; that is, they did not indicate by their zip code that they were a resident of the identified average Appalachian Kentucky county. However, this was likely my error since I was nervous when first approaching individuals; for this reason, I did not clarify the sample frame with the first few participants. Adjusting the sample was a simple fix, as those who were not in the sample frame were omitted during the data screening part of analysis. There was also one participant who did not provide a zip code; that individual's data was omitted because it is not possible to verify residency from the sampling frame. Second, there were some individuals who did not complete the survey. Some indicated to me that they had exited out of the survey either by accident or technology issues. Those 5 individuals who did complete at least through the financial literacy questions were omitted from the data set as well. After this data cleaning, the final sample used in analysis contained 36 individuals' data values.

Descriptive and Demographic Characteristics

Basic demographic characteristics of the sample considered were the participant's residential zip code, gender, age, and race. The data was screened as described in Chapter 3 to include only complete responses from the specified average county, Kentucky residents. Approximately 80.6% of the participants also reported that they were residents of the largest city in the average county and the other 19.4% reported that they were residents of combination of three other cities in the average county. There were only two zip codes not represented from the county. Approximately 61.1% of participants were females and 38.9% of participants were male. Participants ranged from 21 to 77 years of age with a mean age of 40.39 years and a median age of 40 years. 91.7% of participants

identified themselves as being White/Caucasian, and the remaining 8.3% identified as either Hispanic/Latina, Native Hawaiian/Other Pacific Islander, or other.

Other demographic characteristics of the sample reported are based on the three key financial indicators. For the annual household income, the sample mean was approximately $27,016. This value is slightly lower than that reported by the Appalachian Regional Commission (2016b) for the Appalachian Kentucky population. In addition, 48.4% of the participants who indicated a value for their annual household income were classified as being in poverty. This was a higher percentage than the poverty rate of Appalachian Kentucky based the 25.4% as reported by the Appalachian Regional Commission (Appalachian Regional Commission, 2016d). The unemployment rate of the sample was also higher in the sample than the Appalachian Kentucky population. The sample unemployment rate was 16.7%, while the Appalachian Kentucky unemployment rate was 8.5%, according to the Appalachian Regional Commission (2016i). Table 3, presented below, is an amended version of table 1 from Chapter 2; it was applicable to amend it here to include the sample statistics with the previously reported population parameters.

Table 3

Key Financial Indicators for Five Regions.

	Poverty rates, 2010-2014	Poverty rates, percentage of U.S. average	Per capita income (U.S. dollars), 2014	Income, percentage of U.S. average	Unemployment rates, 2014	Unemployment, percentage of U.S. Average
United States	15.6%	100.0%	$46,049	100.0%	6.2%	100.0%
Appalachia	17.2%	110.2%	$37,260	80.9%	6.5%	105.3%
Kentucky	18.9%	121.3%	$37,396	81.2%	6.5%	105.2%
Appalachian Kentucky	25.4%	163.0%	$30,308	65.8%	8.5%	138.3%
Avera county	26.7%	171.2%	$28,128	61.1%	9.0%	146.6%
Sample	48.4%	310.3%	$27,016	58.7%	16.7%	269.4%

This table is a comparison of the three key financial indicators for all regions relevant to this study, including the sample. The values in the table were presented two forms the Appalachian Regional Commission reported rate and that rate as a percent of the US average (Appalachian Regional Commission, 2016c , 2016h, 2016e, n.d.c).

Study Results

The study results are reported here, in Chapter 4, while the findings are interpreted in Chapter 5. In this section I focus on the descriptive statistics as they characterize the sample. This is followed by a discussion on the statistical assumptions applicable to this study.

Characterization of the Sample

To appropriately characterize the sample based on the variables of interest in this study, a discussion of the sample in terms of personal income, poverty, unemployment, and financial literacy follows. The format of the instrument used, the National Financial Capability Study, made it difficult to determine a specific household income. To accommodate this, an approximation was made. The intervals (classes), provided in the "Household Income" survey question, were converted to a new variable that consisted of the group midpoint of each class. There were two exceptions to this rule. First was for the open-ended class "$150,000 or more." I anticipated this response and converted it to $1,000,000 as the group midpoint to err on the side of caution. The data analysis indicated that there was no household income reported as being larger than $75,000 by any of the participants. The second exception was the conversion of the responses "Don't Know" and "Prefer not to say". These responses were converted to missing values since it was not reasonable to assign a quantitative value to this response. This rule did result in five missing data values even though the participant indicated a response to the annual household income survey question. The specific optional responses to this survey question, and the corresponding group midpoints, can be found in Appendix F. After the household income was converted to the group midpoints, a sample mean annual household income was determined to be approximately $27,016, a sample median of $20,000, and a sample mode of $7,500. Table 4 shows the frequencies of each of the survey responses for the annual household income variable.

Table 4

Sample Household Survey Responses

Annual household income	Frequency
Less than $15,000	11
At least $15,000 but less than $25,000	5
At least $25,000 but less than $35,000	5
At least $35,000 but less than $50,000	6
At least $50,000 but less than $75,000	4
Don't know	4
Prefer not to say	1

This table is a frequency distribution of the annual household income survey responses. The values presented only for the choices that received responses.

Poverty was another key financial indicator serving as an independent variable in this study. The poverty rate for the sample was measured as a percentage of the sample that was classified as being in poverty. Recall, a household was considered to be in poverty if the household income was less than the poverty threshold. Being less than the poverty threshold placed the household in the poverty classification, utilizing the methodology of the U.S. Census Bureau's (2017a). The poverty thresholds can be found in table 2 of Chapter 3. Excluding the responses of "Don't Know" and "Prefer not to say" was necessary because the household income variable was used here as described above. Of the 31 valid responses, 51.6% were classified as not being in poverty. Thus, the poverty rate for the sample was 48.4% since 48.4% were classified as being in poverty.

The third key financial indicator of interest in this study was the unemployment rate. Like the poverty variable, the unemployment variable was also a binary variable. Either the participant was employed or not. Question 16 asked the respondent "Which of the following best describes your current employment or work status?". The individuals that classified themselves as "unemployed or temporarily laid off" was considered unemployed; all other responses were considered not unemployed. Table 5 presents a frequency distribution of the current employment status of the sample respondents. This was coded into a new question from the original survey question number 16. Six of the thirty-six respondents clearly indicated that they were unemployed. This resulted in an unemployment rate of 16.7% for the sample statistic.

Table 5

Current Employment Status Survey Responses

Current employment status	Frequency
Self employed	4
Work full-time for an employer or the military	7
Work part-time for an employer or the military	4
Homemaker	5
Permanently sick, disabled, or unable to work	3
Unemployed or temporarily laid off	6
Retired	3
Prefer not to say	4

Table 1 includes a frequency distribution of the current employment status survey responses. The values presented were only for the choices that received responses.

The dependent variable in this study was the financial literacy score. Recall that the instrument used in this study was the National Financial Capability Study, which used 6 questions to test the respondent's level of financial literacy (FINRA Investor Education Foundation, 2016a). The average number of questions answered correctly per respondent was 2.08 or 34.72% correct responses. In comparison, FINRA Investor Education Foundation (2016b) reported that the average number of correct responses 3.16 or 52.67%. It can be seen from table 6 that the sample taken from Appalachian Kentucky appeared to have performed lower than the sample collected by the National Financial Capability Study from the United States on all six questions (FINRA Investor Education Foundation, 2016b).

Table 6

Correct Financial Literacy Survey Responses

Financial literacy question	Appalachian Kentucky	United States
81. Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?	55.6%	75%
82. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?	30.6%	59%
83. If interest rates rise, what will typically happen to bond prices?	11.1%	28%
84. Suppose you owe $1,000 on a loan and the interest rate you are charged is 20% per year compounded annually. If you didn't pay anything off, at this interest rate, how many years would it take for the amount you owe to double?	25%	33%
85. A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less.	61.1%	75%
86. Buying a single company's stock usually provides a safer return than a stock mutual fund.	25%	46%

Table 6 is a percent relative frequency distribution of correct responses to the financial literacy survey questions. The values presented contain the responses from the Appalachian Kentucky sample from this study and the National Financial Capability Study data for the United States (FINRA Investor Education Foundation, 2016b).

Evaluation of the Statistical Assumptions

Assumptions of the *t* test. As previously discussed in Chapter 3, it is necessary to evaluate the statistical assumptions to validate the results of the statistical test performed. There are two main assumptions for the one-sample *t* test. The first was that the financial literacy scores are normally distributed. Normality was assumed since the sample size is larger than 30 ($n = 35$). The second assumption is that the individual financial literacy levels are independent of each other.

Assumptions of multiple linear regression. The assumptions for multiple linear regression are as follows. First, it is notable that the standardized residuals were approximately normally distributed, see Figure 5 below. Recall also that perfect multicollinearity cannot exist between pairs of variables. Field (2013) indicated that any paired correlations above 0.9 (or below -0.9) would indicate a correlation high enough (or low enough) to indicate multicollinearity. It can be seen from Table 7 that the lowest Pearson product-moment correlation coefficient (*r* value) was -0.799, which occurred between the predictor variables, personal income and poverty. This is the only *r* value that would be of any concern based on Field's (2013) guidelines. Lastly, there appears to be homoscedasticity because the variances across the independent variables are homogenous (Gregoire, 2014). This can be seen from the standardized predicted values plotted against the standardized residuals in Figure 6; the graph looks like a random plot of points (Field, 2013).

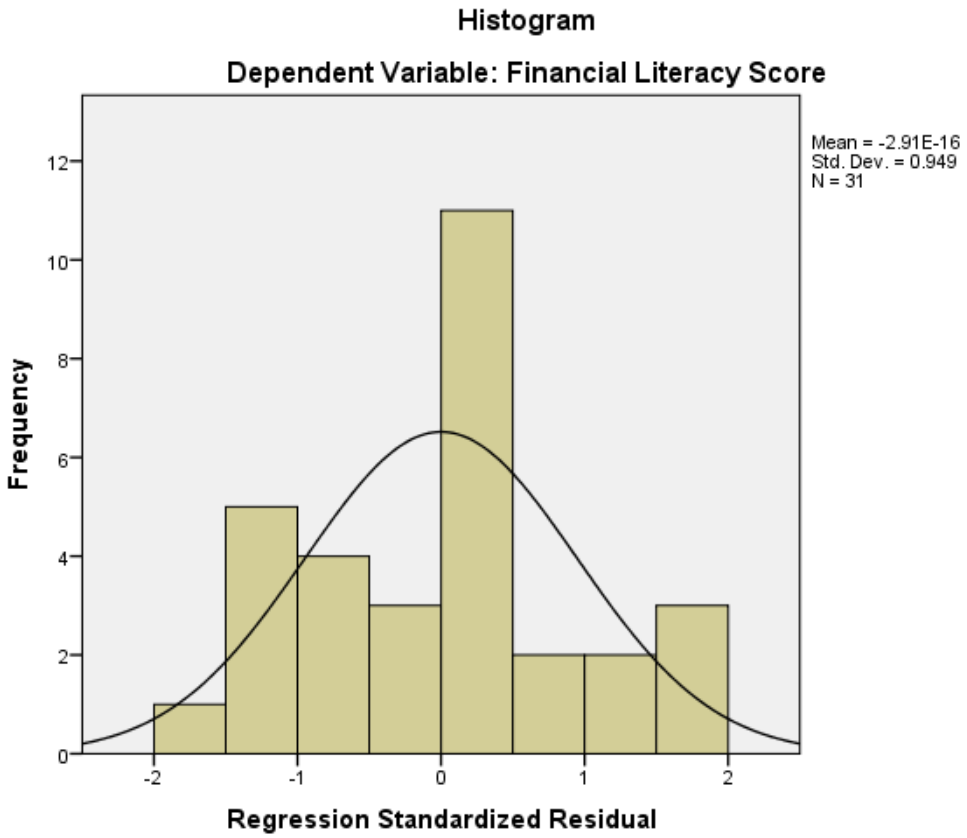

Figure 5. Histogram of the regression standardized residual to frequency.

Table 7

Pearson Product-Moment Correlation Coefficients

	Financial literacy score	Personal income	Poverty	Unemployment
Financial literacy score	1.000	0.363	-0.358	-0.181
Personal income	0.363	1.000	-0.799	-0.313
Poverty	-0.358	-0.799	1.000	0.179
Unemployment	-0.181	-0.313	0.179	1.000

Table 7 offers the values of the Pearson product-moment correlation coefficients for all combinations of the four variables in this study.

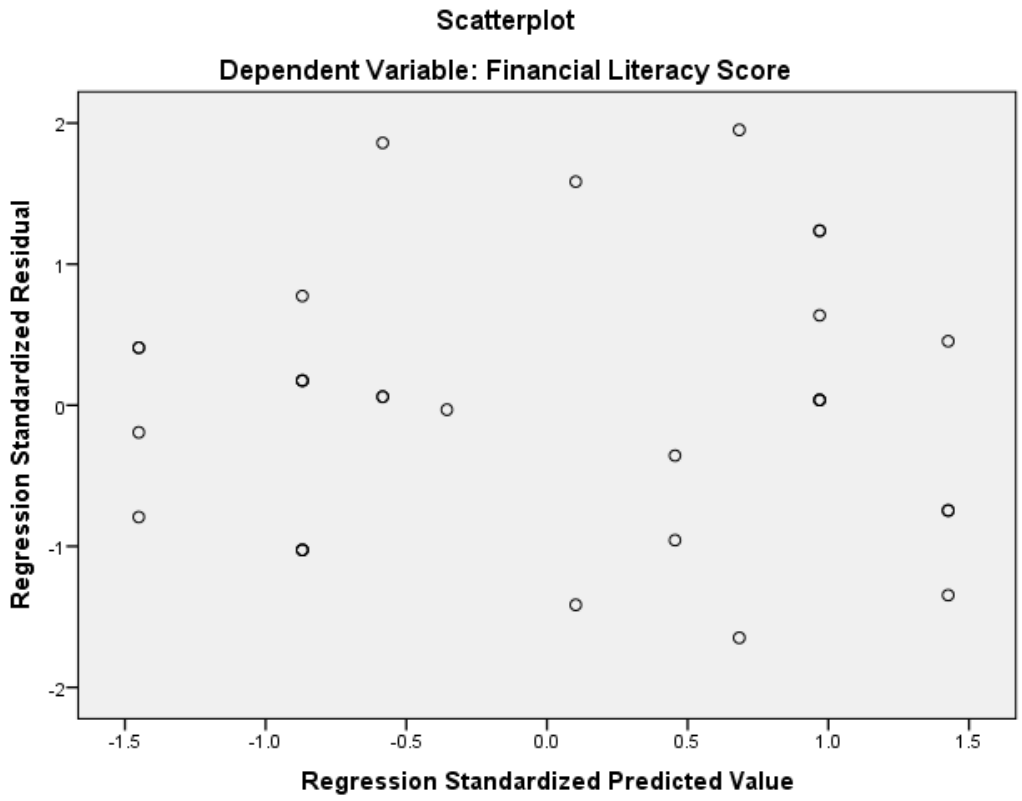

Figure 6. The regression standardized predicted values plotted against the standardized residuals.

Statistical Analysis for Research Question 1

The first research question asked: What is the degree to which the levels of financial literacy between Appalachian Kentuckians and Americans differ? The hypotheses were as follows:

> $H_0$1: There is no significant difference between the mean level of financial literacy of Appalachian Kentuckians and the constant value representing the financial literacy level of Americans.

H_a1: There is a significant difference between the mean levels of financial literacy of Appalachian Kentuckians and the constant value representing the financial literacy level of Americans.

To evaluate the research question, a two-sample *t* test was performed. The constant 52.667%, was the financial literacy level reported by the FINRA Investor Education Foundation (2016b) for Americans. This test was performed to determine whether the mean level of financial literacy of Appalachian Kentuckians was significantly different than 52.667%, the mean level of financial literacy for Americans. The sample mean for Appalachian Kentuckians was 34.722%, with a standard deviation of 28.277%, was significantly different from 52.667%, t (35) = -3.808, p = 0.001 with alpha set at 0.05; that is, the null hypotheses was rejected. The 95% confidence interval for the level of financial literacy of Appalachian Kentuckians ranged from 25.155% to 44.29%. The effect size d = -0.644 indicates a medium effect size, since the sample mean is smaller than the test value, 52.667%. The results of the *t* test support the conclusion that the financial literacy level of Appalachian Kentuckians is less than that of Americans.

Statistical Analysis for Research Question 2

The second research question posed in this study was: What is the relationship between the financial literacy level of Appalachian Kentuckians and the Appalachian Kentucky poverty, unemployment, and personal income rates? And the two hypotheses were as follows:

$H_0$2: The Appalachian Kentucky financial literacy rate is not affected by the Appalachian Kentucky poverty, unemployment, or personal income rates.

H_a2: The Appalachian Kentucky financial literacy rate is affected by at least one of the variables Appalachian Kentucky poverty, unemployment, or personal income rates.

To answer the hypotheses for research question 2, multiple linear regression was used. To perform this multiple linear regression analysis, the forced entry method was used. According to Field (2013), forced entry is useful when the researcher does not have a predetermined reason for choosing the order in which the predictor variables are entered, as is the case for Hierarchical (Blockwise) entry in the multiple linear regression model. There was a third choice, stepwise entry, but Field (2013) emphasizes the many reasons this method is frowned upon in the statistical community.

It is important to make a few notes about the variable. First, the unemployment variable was a binary variable since it is simply a matter of presence or absence (either unemployment was present or it was not). While poverty was similar to the unemployment variable in that it was also a binary variable or a presence versus absence variable. The poverty variable was determined using the personal income data, the household size, and the poverty threshold (U.S. Census Bureau, 2017a). The results of the multiple linear regression follow.

The *F* test was used to determine the significance of the fit of the linear regression models applicable to the testing the hypotheses. The null hypothesis eliminated all predictor variables, while the alternative hypotheses considered the relationship of the

dependent variable with at least one of the independent variables; thus, it was necessary to review the linear regression test for all possible groups of the three predictor variables. That is, it was necessary to run the model for all three predictor variables, two predictor variables at a time, and then each predictor variable individually; resulting in seven groups. Two of the seven models produced significant results; therefore, I rejected the null hypotheses since the financial literacy rate for Appalachian Kentuckians was affected by at least one of the personal income, poverty, or unemployment variables. ANOVA tables for both of the models with significance are depicted in tables 8 and 9; the model for the predictor variable, personal income, and the response variable, financial literacy score, is in table 8, and the model for the predictor variable, poverty, and the response variable, financial literacy score, is in table 9. Appendix G contains the remaining 5 ANOVA tables.

The ANOVA test produced statistically significant results for the linear relationship between the personal income and the financial literacy score, the independent and dependent variables, respectively. The result was significant at a 95% confidence level, or $\alpha = 0.05$. There was a significant relationship between personal income and the financial literacy score, the independent and dependent variables, respectively, F (1, 29) = 4.391, p = 0.0.045, R = 0.363, Adj. R^2 = 0.102.

Table 8

One-Way ANOVA Table for the Relationship between Poverty (Independent Variable) and Financial Literacy Score (Dependent Variable)

Source	*df*	*SS*	*MS*	*F*-ratio	Sig.
Between groups	1	3,228.93	3,228.93	4.39	0.045
Within groups	29	21,323.04	735.28		
Total	30	24,551.97			

Note. *df* = degrees of freedom, SS = sum of square, MS = mean square, Sig. = significance (two-tailed).

Additionally, the ANOVA test indicated that at a 95% confidence level, or $\alpha = 0.05$, statistically significant results were found for the independent variable, poverty; and the dependent variable, financial literacy score, as can be seen in table 9. There was a significant relationship between the independent variable, poverty; and the dependent variable, financial literacy score; F (1, 29) = 4.253, p = 0.048, R = 0.358, Adj. R^2 = 0.098. Since at least one significant model was found, the null hypothesis was rejected.

Table 9

One-Way ANOVA Table for the Relationship between Poverty (Independent Variable) and Financial Literacy Score (Dependent Variable)

Source	*df*	*SS*	*MS*	*F*-ratio	Sig.
Between groups	1	3,139.93	3,139.93	4.25	0.048
Within groups	29	21,412.04	738.35		
Total	30	24,551.97			

Note. *df* = degrees of freedom, SS = sum of square, MS = mean square, Sig. = significance (two-tailed).

The independent variable, poverty, was significantly related to the financial literacy score. Further, the relationship was negative since the beta value was negative, as seen in table 10. Poverty was a predictor of financial literacy with $\beta = -0.358$, $sr_i^2 = (-0.358)^2 = 0.128$. Poverty was a significant predictor of financial literacy score for $\alpha = 0.05$, since $t(29) = -2.062$, $p = 0.048$. This second model supported rejecting the null hypotheses.

The correlation (r) value was 0.358 between the financial literacy score and poverty, the dependent and independent variables, respectively. The adjusted R-square is 0.102. This meant that poverty accounted for approximately 10.2% of the variation in the financial literacy score. This indicated that some other variables must have existed that influenced the other 89.8% of the variation. The coefficients of the independent variables for the regression line and the y-intercept of the regression line are presented in table 10.

For poverty, b = -20.139 means that for every one unit increase in poverty, there will be a -20.139 decrease in the financial literacy score. The linear model is:

Financial Literacy Score = 47.917 + (-20.139 poverty)

Personal income produced a slightly better prediction model than poverty did with the dependent variable, financial literacy score. The independent variable, personal income, was significantly related to the financial literacy score. Further, the relationship was positive since the beta values are positive, as seen in table 10. Personal income was a predictor of financial literacy with $\beta = 0.363$, $sr_i^2 = (0.363)^2 = 0.132$. Personal income was a significant predictor of financial literacy score for $\alpha = 0.05$, since $t(29) = 2.096$, $p = 0.045$.

The correlation (r) value was 0.363 between the financial literacy score and personal income, the dependent and independent variables, respectively. This indicated a positive association between financial literacy and personal income. That is, as personal income increased in the sample, the financial literacy levels also increased. The adjusted coefficient of determination was 0.098. This meant that personal income accounted for approximately 9.8% of the variation in the financial literacy score. This was an indication that other variables must have existed that influenced the other 90.2% of the variation. The coefficients of the independent variables for the regression line and the y-intercept of the regression line are presented in table 10. For personal income, b = 0.001 means that for every one unit increase in personal income, there will be a 23.505 decrease in the financial literacy score. The linear model is:

Financial Literacy Score = 23.505 + (0.001 personal income)

Table 10

Multiple Regression Table for Both Models, with Significance, for the Specified Independent Variables and the Dependent Variable, Financial Literacy Score

	B	Standard error	β	sr_i^2	t	Sig.
Model 1						
Constant	23.505	8.527			2.757	0.010
Personal income	0.001	0.000	0.363	0.132	.096	0.045
Model 2						
Constant	47.917	6.793			7.054	0.000
Poverty	-20.139	9.766	-0.358	0.128	-2.062	0.048

Note. *df* = degrees of freedom, SS = sum of square, MS = mean square, Sig. = significance (two-tailed).

Summary

The analysis described in Chapter Four supported the answers to the research questions. In reference to the first research question, the financial literacy level of Appalachian Kentuckians differed significantly from the level of financial literacy in Americans. Specifically, the sample mean level of financial literacy of Appalachian Kentuckians of 34.722% was significantly different from 52.667%, the financial literacy level of Americans (FINRA Investor Education Foundation, 2016b). It was determined that there was a relationship between the financial literacy level of Appalachian Kentuckians and at least one of the three key financial indicators. The significant relationship was found in two of the linear regression models. The level of financial

literacy was significantly related to poverty of Appalachian Kentuckians. However, a slightly better predictor of financial literacy was found to be the personal income of Appalachian Kentuckians.

The next, and final, chapter of this study provides further discussion of the results and an interpretation of the findings. In addition, Chapter 5 provides insight into the limitations of this study and recommendations for further research. Finally, implications of the study in terms of positive social change, methodological and empirical implications are presented.

Chapter 5: Discussion, Conclusions, and Recommendations

Various researchers have expressed evidence and concerns for the lack of financial literacy in the United States (FINRA Investor Education Foundation, 2013, 2016a; Mandell, 2008; OECD, 2014; Robb, 2014). The literature indicated a repetitive concern for the financial state of the Appalachian Kentucky region specifically regarding the Appalachian region in relation to three key financial indicators: poverty, unemployment, and personal income (Deaton & Niman, 2012; Gebremariam et al., 2011; Perdue & Sanchagrin, 2016; Thorne et al., 2004). This was a quantitative, nonexperimental, cross-sectional study of financial literacy in Appalachian Kentucky. The results indicated that the level of financial literacy for residents of Appalachian Kentucky was statistically lower than that of the residents of the entire United States. In addition, a relationship was found between the financial literacy level of Appalachian Kentuckians and two of the three key financial indicators. Two models were found to be significant using multiple linear regression: (a) poverty was a predictor of the financial literacy level, and (b) personal income was also a predictor of financial literacy level. No relationship was found between Appalachian Kentucky financial literacy levels and unemployment. This baseline data and initial understanding of financial literacy in Appalachian Kentucky could help researchers to understand how to improve the financial state of the Appalachian Kentucky region.

Interpretation of Findings

Many studies have previously demonstrated that American adults and other populations maintain low levels of financial literacy (FINRA Investor Education

Foundation, 2013, 2016a; Mandell, 2008; OECD, 2014; Robb, 2014). Appalachian Kentuckians are also Americans; hence, this study has contributed to the extensive existing literature finding that Americans do not have the necessary level of financial literacy. As a subset of the American population, this study demonstrated that the Appalachian Kentucky region also has low levels of financial literacy, on average. Though some individuals in the sample did indicate an adequate level of financial literacy, the mean score was still significantly lower than the already unacceptable level of financial literacy in the full American population.

Financial Literacy and Appalachian Kentucky

The economic state of the Appalachian region has been a national concern for much of recent history (Compion, et al., 2015; Douglas & Walker, 2012; Scanlan, 2014; Thorne et al., 2004). Being in the bottom 10% of the nation's counties in terms of economic status put many Appalachian Kentucky counties in the distressed classification (Appalachian Regional Commission, 2016a). Specific concerns in the literature for this region were in the area of poverty, unemployment, and personal income (Deaton & Niman, 2012; Douglas & Walker, 2012; Greenberg, 2016; James & James, 2016; Perdue & Sanchagrin, 2016; Robinson, 2015; Thorne et al., 2004).

The financial disadvantage of the Appalachian Kentucky region led to efforts over time to attempt to improve the financial state of the region (Compion, et al., 2015; Douglas & Walker, 2012; Thorne et al., 2004). Despite those efforts, problems persist. Thus, the baseline information on the financial literacy level of Appalachian Kentuckians might be the most important contribution of this study. Existing literature provided no

indication of the financial literacy levels in Appalachia and, more precisely, Appalachian Kentucky. Financial literacy has been shown to be an important characteristic of a financially secure individual, so the existing literature was lacking in this area (Agnew et al., 2015; Lusardi, 2015; Raina, 2014). However, this study has begun to fill this gap by providing a baseline value for the financial literacy level of Appalachian Kentuckians.

Financial Literacy and the Three Key Financial Indicators

The three key financial indicators of focus in this study were personal income, poverty, and unemployment; these were three important areas researchers had focused on in the existing literature. By focusing on these three variables, this study has contributed to the existing literature by confirming as well as disconfirming existing knowledge from peer-reviewed literature from the perspective of each of these financial indicators.

Financial literacy and poverty. The results of this study confirmed the pre-existing research; for instance, a positive association between financial literacy and socioeconomic status was previously demonstrated (Lusardi & Mitchell, 2014). Khan et al. (2016) explained poverty came with financial deprivation, which was more prominent in rural regions; this study has also shown that there are still concerns in the area of poverty, income, and unemployment in Appalachian Kentucky, an area that is predominately rural. Not only did this study indicate financial literacy concerns in Appalachian Kentucky, but it also contributes to rural financial literacy data.

Financial literacy and personal income. Various studies have explored financial literacy and income. These studies have produced cause for concern by showing that financial literacy is affected by personal income status (Buckland et al., 2013; Henager &

Mauldin, 2015; Tuominen & Thompson, 2015). This study contributed to this area of research by also indicating that financial literacy levels can be predicted by personal income.

Financial literacy and unemployment. .Previous studies have found a relationship between employment status and financial literacy in some populations (Lusardi & Mitchell, 2011a; Lusardi & Mitchell, 2011b). This study does not support the existing position on financial literacy and unemployment. There was no linear relationship indicated between employment status and financial literacy based on the results of this study. There may be other variables that were not accounted for in this study that may explain the relationship between employment status and financial literacy. Future research could consider this.

Appalachian Kentucky, Financial Literacy, and Human Capital Theory

This study is founded in human capital theory. Economic growth includes the success of the individuals of a given population. This holds true for the Appalachian Kentucky region. Improvement in an individual's economic position translates to improvement in the overall economic status, provided that enough individuals improve. human capital theory emphasizes the economic value in humans. Increased human capital can come from financial education and financial knowledge (Finke & Huston, 2014; Huston, 2015; Potrich et al., 2016).

The results of this study indicated that the Appalachian Kentucky region could benefit from improved financial literacy because of the low levels of financial literacy and the associations found between financial literacy and at least one of the three key

financial indicators. Since a need has been indicated by this study in the area of financial literacy, there could be human capital benefits from considering methods of improving the financial literacy of Appalachian Kentuckians. Both Henager and Mauldin (2015) and Huston (2015) emphasized that growth in personal financial knowledge should be viewed as an increase in human capital. James and James (2016) even suggested that states spend more on human capital to improve poverty rates. Thus, the human capital view on financial literacy is important from the perspective of management.

Limitations of the Study

Potential threats to the validity of this study were explored in previous chapters. Awareness of these threats help to determine to what extent the results can be generalized. The biggest threat was to external validity because a sample was used to represent the population; this is a concern anytime a sample is used. The sample was justifiable because mathematical methods were used to identify the county that best represented the Appalachian Kentucky population for this study. However, the results of this study may not accurately represent the population; nevertheless, it is important to acknowledge that this study begins the discussion on financial literacy in Appalachian Kentucky. Additionally, some respondents might have been distracted by their personal responsibilities and surroundings. For these reasons, this may have caused conflicts with the external validity of the study because responses may not accurately represent the participants' knowledge.

The validity of the construct was dependent upon the survey that was used to obtain the financial literacy data; construct validity is assumed because the National

Financial Capability Study has been widely used in existing research (Allgood & Walsted, 2013; Babiarz & Robb, 2014; Lusardi & Mitchell; 2011a; Lusardi & Mitchell, 2011b; Lusardi & Mitchell, 2014; Potrich et al., 2016; Robb et al., 2015; Schuhen & Schürkmann, 2014). Three of the financial literacy questions from the National Financial Capability Study are those that were developed by Lusardi and Mitchell (2011a, 2011b, 2014). The widespread use of these questions in other studies does contribute to the validity of the construct.

Recommendations

The limitations of this study lead to suggestions or recommendations for improving the study and for future research. The sample selection offers one area for recommendations for future research. The sample selection was mathematically founded, yet there are many other sample selection methods that could improve the generalizability of the study. Future research could expand the sample selection to include participants from all counties in Appalachian Kentucky. Another option might be to consider coordinating data collection within the same time frame as the next National Financial Capability Study poll, to minimize the validity issues discussed previously with the data being collected at different points in time.

Additionally, future researchers could consider expanding the population of this study. It could be extended to explore the financial literacy levels in the entire Appalachian region. This would allow researchers to see if the lower levels of financial literacy are unique to Appalachian Kentucky or if it extends to all of Appalachia, since many of the concerns for the three key financial indicators are for all of Appalachia.

The high paired correlation between poverty and personal income should also be considered for areas of improving this study or conducting further investigations of financial literacy in Appalachian Kentucky. Recall that the Pearson product-moment correlation coefficient was -0.799 occurring between the personal income variable and the poverty variable. This value is within the recommendation of being less than 0.9 by Field (2013). This high paired correlation was logical since poverty status was determined partially by personal income but could indicate that there may be better variables to predict the financial literacy score than simply the poverty variable. The poverty variable was determined using the poverty threshold. The poverty threshold required information about personal income and the household size (U.S. Census Bureau, 2017a). This indicated an opportunity for future research to explore relationships between the financial literacy score and the variables used to develop the poverty variable. For example, future research could consider if a relationship between the financial literacy score and these other variables that are related to the poverty variable, such as the income deficit. The income deficit is the difference between household income and the poverty threshold.

Expanding the employment variable may also offer a better explanation of the relationship between financial literacy of Appalachian Kentuckians. This study was restricted to classifying individuals as being unemployed or not. Hence, the study could be extended by expanding that measurement to look at the different choices for employment status (retired, self-employed, unemployed, homemaker, etc.) rather than simply employed or not.

Future research should also explore how to utilize the results of this study to improve the financial state of the Appalachian Kentucky region. Data was collected from the National Financial Capability Study that could be used to explore the financial education sources of Appalachian Kentuckians. Existing sources of financial knowledge could be related to the level of financial literacy. The sources explored by the National Financial Capability Study instrument used in this study include parental guidance, formal education, employer programs, and so forth.

The National Financial Capability Study survey was extensive. It allowed for different levels of data to be collected. This meant that there were many possibilities to recommend for exploration in future research.

Implications

It bears repeating that the Appalachian region is in need of positive social change, especially since Appalachia has remained one of the poorest regions in America (Deaton & Niman, 2012; Douglas & Walker, 2012; Partridge et al., 2012). Financial literacy rates have been described as being low across the nation (FINRA Investor Education Foundation, 2013, 2016a; Huston, 2012; Lusardi & Mitchell, 2014; Mandell, 2008; OECD, 2014; Robb, 2014). Yet, the results of this study indicated that there were even lower levels of financial literacy in Appalachian Kentucky. This indicate a justifiable need for investing in the financial literacy of Appalachian Kentuckians. Financially literate individuals perform better as employees, and hence, should have a positive impact on the economy of their community (Huston, 2012; Lemmer & Sampson, 2015).

The baseline data obtained in this study introduces a new statistic to the existing literature on financial literacy, where one did not exist before. Specifically, there is now a baseline measure of the financial literacy of Appalachian Kentuckians. The results indicated that Appalachian Kentuckians were at a lower level of financial literacy than Americans, in general. This study has the potential to invoke positive social change, because this baseline information gives a foundation for an argument in support of beginning to determine how to improve these financial literacy levels in the Appalachian Kentucky region. As a result, improvements in financial literacy levels should show improvements in personal income and poverty levels of the Appalachian Kentucky region because of the positive association found by the linear regression analysis in this study. The study results indicated a need for an improvement in the financial literacy levels of Appalachian Kentuckians. This offers positive social change through offering another avenue for attempting to improve the economic state of this region perpetually in need of positive change.

The results of this study do not imply that poverty or personal income causes financial literacy since the collection of cross-sectional data does not allow the interpretation of causation (Robb et al., 2015). However, using the linear regression analysis to determining association allows researchers and policymakers to identify at-risk populations. In this instance, the association found between the level of financial literacy and poverty brings attention to the need to focus on financial literacy efforts in areas where high levels of poverty exist. Specifically, the results of this study provide a

reason for policy makers to implement new financial literacy programs and improve existing financial literacy programs in the Appalachian Kentucky region.

Conclusions

There has been a national concern for the low levels of financial literacy in the United States (FINRA Investor Education Foundation, 201, 2016a; Mandell, 2008; OECD, 2014; Robb, 2014). The results of this study have reemphasized the poverty, personal income, and unemployment values of the Appalachian region that continued to garner national attention since President Lyndon B. Johnson began to take notice (Compion, et al., 2015; Douglas & Walker, 2012; Thorne et al., 2004). Many programs have attempted to improve the region, but poor statistics continue to plague the region. The results of this study have indicated a need for financial literacy efforts in the Appalachian Kentucky region. Focusing improvement efforts on this region will not only have a positive social impact on the individual and the region, but the nation could benefit as well, since Appalachian Kentucky is a subset of the entire American population. Financial literacy does not only impact the individual. Financially literate individuals are valuable within their community and as part of the workforce (Huston, 2012). Based on these results, there are indications that expanding the boundaries of the policies and programs dedicated to improving the Appalachian Kentucky region should benefit from including more efforts in the area of financial literacy.

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Appendix A: Key Financial Indicators for Appalachian Kentucky

	Poverty Rate, Percent of U.S. Average, 2010–2014	x-Mu	Per Capita Income, Percent of U.S. Average, 2014	x-Mu	Unemployment Rate, Percent of U.S. Average, 2014	x-Mu
United States	100.00%		100.00%		100.00%	
Appalachian Region	110.20%		80.90%		105.30%	
Kentucky	121.30%		81.20%		105.20%	
Appalachian Kentucky	163.00%		65.80%		138.30%	
Adair	127.00%	-43.42%	56.50%	-6.28%	133.90%	-14.16%
Bath	171.20%	0.78%	61.10%	-1.68%	146.60%	-1.46%
Bell	209.80%	39.38%	60.60%	-2.18%	165.50%	17.44%
Boyd	126.60%	-43.82%	76.80%	14.02%	120.80%	-27.26%
Breathitt	202.30%	31.88%	65.70%	2.92%	187.90%	39.84%
Carter	119.70%	-50.72%	62.90%	0.12%	175.20%	27.14%
Casey	184.80%	14.38%	58.90%	-3.88%	113.20%	-34.86%
Clark	99.60%	-70.82%	87.80%	25.02%	99.60%	-48.46%
Clay	228.80%	58.38%	54.50%	-8.28%	186.10%	38.04%
Clinton	155.40%	-15.02%	61.50%	-1.28%	147.50%	-0.56%
Cumberland	166.70%	-3.72%	63.80%	1.02%	124.00%	-24.06%
Edmonson	107.90%	-62.52%	61.50%	-1.28%	133.80%	-14.26%
Elliott	189.50%	19.08%	43.20%	-19.58%	185.80%	37.74%
Estill	187.00%	16.58%	61.50%	-1.28%	121.30%	-26.76%
Fleming	125.70%	-44.72%	62.40%	-0.38%	128.00%	-20.06%
Floyd	189.50%	19.08%	70.50%	7.72%	167.70%	19.64%
Garrard	132.60%	-37.82%	64.70%	1.92%	107.40%	-40.66%
Green	135.10%	-35.32%	68.60%	5.82%	106.30%	-41.76%
Greenup	115.30%	-55.12%	76.40%	13.62%	135.50%	-12.56%
Harlan	205.70%	35.28%	59.60%	-3.18%	224.70%	76.64%
Hart	165.80%	-4.62%	62.30%	-0.48%	103.10%	-44.96%
Jackson	203.10%	32.68%	52.40%	-10.38%	186.00%	37.94%
Johnson	162.40%	-8.02%	67.70%	4.92%	150.10%	2.04%
Knott	170.10%	-0.32%	60.70%	-2.08%	181.40%	33.34%
Knox	216.50%	46.08%	60.80%	-1.98%	162.40%	14.34%
Laurel	149.50%	-20.92%	67.10%	4.32%	123.80%	-24.26%
Lawrence	150.90%	-19.52%	60.00%	-2.78%	156.20%	8.14%
Lee	214.30%	43.88%	53.60%	-9.18%	158.00%	9.94%
Leslie	153.30%	-17.12%	64.60%	1.82%	207.70%	59.64%
Letcher	156.80%	-13.62%	64.10%	1.32%	199.50%	51.44%
Lewis	211.90%	41.48%	58.10%	-4.68%	156.80%	8.74%
Lincoln	160.10%	-10.32%	59.80%	-2.98%	141.80%	-6.26%
Madison	139.00%	-31.42%	70.40%	7.62%	87.60%	-60.46%
Magoffin	172.00%	1.58%	53.80%	-8.98%	226.50%	78.44%
Martin	217.30%	46.88%	59.60%	-3.18%	147.90%	-0.16%
McCreary	241.50%	71.08%	48.10%	-14.68%	173.60%	25.54%
Menifee	184.80%	14.38%	60.20%	-2.58%	160.20%	12.14%
Metcalfe	138.80%	-31.62%	60.10%	-2.68%	98.60%	-49.46%
Monroe	165.70%	-4.72%	66.90%	4.12%	90.60%	-57.46%
Montgomery	161.40%	-9.02%	68.70%	5.92%	121.50%	-26.56%
Morgan	190.50%	20.08%	51.50%	-11.28%	153.20%	5.14%
Nicholas	103.30%	-67.12%	69.30%	6.52%	130.00%	-18.06%
Owsley	251.30%	80.88%	59.20%	-3.58%	166.50%	18.44%
Perry	170.80%	0.38%	75.10%	12.32%	167.50%	19.44%
Pike	154.80%	-15.62%	73.50%	10.72%	169.60%	21.54%
Powell	176.60%	6.18%	65.00%	2.22%	138.90%	-9.16%
Pulaski	166.50%	-3.92%	73.00%	10.22%	119.80%	-28.26%
Robertson	170.50%	0.08%	62.40%	-0.38%	124.40%	-23.66%
Rockcastle	160.40%	-10.02%	59.90%	-2.88%	120.50%	-27.56%
Rowan	166.60%	-3.82%	61.10%	-1.68%	112.70%	-35.36%
Russell	173.10%	2.68%	65.00%	2.22%	162.10%	14.04%
Wayne	163.60%	-6.82%	56.70%	-6.08%	160.80%	12.74%
Whitley	154.80%	-15.62%	65.90%	3.12%	141.30%	-6.76%
Wolfe	284.30%	113.88%	55.20%	-7.58%	183.80%	35.74%

Appendix B: Alphabetically Organized Appalachian Kentucky Counties

1 Adair

2 Bath

3 Bell

4 Boyd

5 Breathitt

6 Carter

7 Casey

8 Clark

9 Clay

10 Clinton

11 Cumberland

12 Edmonson

13 Elliott

14 Estill

15 Fleming

16 Floyd

17 Garrard

18 Green

19 Greenup

20 Harlan

21 Hart

22 Jackson

23 Johnson

24 Knott

25 Knox

26 Laurel

27 Lawrence

28 Lee

29 Leslie

30 Letcher

31 Lewis

32 Lincoln

33 Madison

34 Magoffin

35 Martin

36 McCreary

37 Menifee

38 Metcalfe

39 Monroe

40 Montgomery

41 Morgan

42 Nicholas

43 Owsley

44 Perry

45 Pike

46 Powell

47 Pulaski

48 Robertson

49 Rockcastle

50 Rowan

51 Russell

52 Wayne

53 Whitley

54 Wolfe

Appendix C: Euclidean Distances

			x		y		z
	Population, April 1, 2010	Poverty Rate, 2010–2014	Poverty Rate, z-score	Per Capita Income, 2014	Per Capita Income, z-score	Unemployment Rate, 2014	Unemployment Rate, z-score
United States	308,745,538	15.60%		$46,049		6.20%	
Appalachian Region	25,243,456	17.20%		$37,260		6.50%	
Kentucky	4,339,367	18.90%		$37,396		6.50%	
Appalachian Kentucky	1,184,278	25.40%		$30,308		8.50%	
Mean		26.57%	0.0000	$28,910	0.0000	9.13%	0.0000
Standard Deviation		0.058548218	1.0000	3485.270579	1.0000	0.020301501	1.0000
Adair	18,656	19.80%	-1.1570	$26,038	-0.8241	8.30%	-0.4105
Bath	11,591	26.70%	0.0215	$28,128	-0.2244	9.00%	-0.0657
Bell	28,691	32.70%	1.0463	$27,927	-0.2821	10.20%	0.5254
Boyd	49,542	19.70%	-1.1741	$35,347	1.8469	7.40%	-0.8538
Breathitt	13,878	31.50%	0.8413	$30,257	0.3865	11.60%	1.2150
Carter	27,720	18.70%	-1.3449	$28,953	0.0123	10.80%	0.8210
Casey	15,955	28.80%	0.3802	$27,126	-0.5119	7.00%	-1.0508
Clark	35,613	15.50%	-1.8914	$40,425	3.3039	6.10%	-1.4941
Clay	21,730	35.70%	1.5587	$25,090	-1.0961	11.50%	1.1658
Clinton	10,272	24.20%	-0.4055	$28,327	-0.1673	9.10%	-0.0164
Cumberland	6,856	26.00%	-0.0981	$29,369	0.1317	7.60%	-0.7553
Edmonson	12,161	16.80%	-1.6694	$28,323	-0.1685	8.30%	-0.4105
Elliott	7,852	29.60%	0.5168	$19,879	-2.5912	11.50%	1.1658
Estill	14,672	29.20%	0.4485	$28,342	-0.1630	7.50%	-0.8045
Fleming	14,348	19.60%	-1.1912	$28,726	-0.0528	7.90%	-0.6075
Floyd	39,451	29.50%	0.4997	$32,459	1.0183	10.30%	0.5747
Garrard	16,912	20.70%	-1.0033	$29,802	0.2559	6.60%	-1.2479
Green	11,258	21.10%	-0.9350	$31,592	0.7695	6.60%	-1.2479
Greenup	36,910	18.00%	-1.4644	$35,200	1.8047	8.40%	-0.3612
Harlan	29,278	32.10%	0.9438	$27,425	-0.4261	13.90%	2.3479
Hart	18,199	25.90%	-0.1151	$28,696	-0.0614	6.40%	-1.3464
Jackson	13,494	31.70%	0.8755	$24,129	-1.3718	11.50%	1.1658
Johnson	23,356	25.30%	-0.2176	$31,162	0.6461	9.30%	0.0821
Knott	16,346	26.50%	-0.0127	$27,947	-0.2763	11.20%	1.0180
Knox	31,883	33.80%	1.2342	$28,007	-0.2591	10.00%	0.4269
Laurel	58,849	23.30%	-0.5592	$30,916	0.5755	7.60%	-0.7553
Lawrence	15,860	23.50%	-0.5250	$27,611	-0.3727	9.60%	0.2299
Lee	7,887	33.40%	1.1659	$24,691	-1.2106	9.70%	0.2791
Leslie	11,310	23.90%	-0.4567	$29,735	0.2367	12.80%	1.8061
Letcher	24,519	24.50%	-0.3543	$29,506	0.1710	12.30%	1.5598
Lewis	13,870	33.00%	1.0975	$26,759	-0.6172	9.70%	0.2791
Lincoln	24,742	25.00%	-0.2689	$27,520	-0.3989	8.70%	-0.2134
Madison	82,916	21.70%	-0.8325	$32,406	1.0030	5.40%	-1.8389
Magoffin	13,333	26.80%	0.0386	$24,791	-1.1819	14.00%	2.3972
Martin	12,929	33.90%	1.2513	$27,447	-0.4198	9.10%	-0.0164
McCreary	18,306	37.70%	1.9003	$22,152	-1.9390	10.70%	0.7717
Menifee	6,306	28.80%	0.3802	$27,737	-0.3366	9.90%	0.3776
Metcalfe	10,099	21.70%	-0.8325	$27,683	-0.3521	6.10%	-1.4941
Monroe	10,963	25.80%	-0.1322	$30,798	0.5417	5.60%	-1.7404
Montgomery	26,499	25.20%	-0.2347	$31,619	0.7772	7.50%	-0.8045
Morgan	13,923	29.70%	0.5339	$23,713	-1.4912	9.40%	0.1314
Nicholas	7,135	16.10%	-1.7890	$31,908	0.8602	8.00%	-0.5583
Owsley	4,755	39.20%	2.1565	$27,274	-0.4694	10.30%	0.5747
Perry	28,712	26.60%	0.0044	$34,578	1.6262	10.30%	0.5747
Pike	65,024	24.10%	-0.4226	$33,850	1.4174	10.50%	0.6732
Powell	12,613	27.50%	0.1581	$29,930	0.2926	8.60%	-0.2627
Pulaski	63,063	26.00%	-0.0981	$33,607	1.3476	7.40%	-0.8538
Robertson	2,282	26.60%	0.0044	$28,745	-0.0474	7.70%	-0.7060
Rockcastle	17,056	25.00%	-0.2689	$27,596	-0.3770	7.40%	-0.8538
Rowan	23,333	26.00%	-0.0981	$28,114	-0.2284	7.00%	-1.0508
Russell	17,565	27.00%	0.0727	$29,910	0.2869	10.00%	0.4269
Wayne	20,813	25.50%	-0.1835	$26,113	-0.8026	9.90%	0.3776
Whitley	35,637	24.10%	-0.4226	$30,324	0.4057	8.70%	-0.2134
Wolfe	7,355	44.30%	3.0276	$25,437	-0.9965	11.30%	1.0672
mean	**21,931**	**26.57%**	**0**	**28,910**	**0**	**9.13%**	**0**

Appendix D: Lusardi and Mitchell's Financial Literacy Questions

1. Understanding of Interest Rate (Numeracy). Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

(i) More than $102

(ii) Exactly $102

(iii) Less than $102

(iv) Do not know

(v) Refuse to answer

2. Understanding of Inflation. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

(i) More than today

(ii) Exactly the same

(iii) Less than today

(iv) Do not know

(v) Refuse to answer

3. Understanding of Risk Diversification. Please tell me whether this statement is true or false. 'Buying a single company's stock usually provides a safer return than a stock mutual fund'.

(i) True

(ii) False

(iii) Do not know

(iv) Refuse to answer (p. 511-512)

Appendix E: National Financial Capability Study Additional Financial Literacy Questions

1. Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

(i) More than $102

(ii) Exactly $102

(iii) Less than $102

(iv) Don't know

(v) Prefer not to say

2. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

(i) More than today

(ii) Exactly the same

(iii) Less than today

(iv) Don't know

(v) Prefer not to say

3. If interest rates rise, what will typically happen to bond prices?

(i) They will rise

(ii) They will fall

(iii) They will stay the same

(iv) There is no relationship between bond prices and the interest rate

(v) Don’t know

Prefer not to say

Appendix F: Household Income Survey Data from Question #9

9. Question 9 surveyed participants about their income level, and it said “What is your household’s approximate annual income, including wages, tips, investment income, public assistance, income from retirement plans, etc.? Would you say it is…”.

Question 9 Response	Group Midpoint of the Income
Less than $15,000	$7,500
At least $15,000 but less than $25,000	$20,000
At least $25,000 but less than $35,000	$30,000
At least $35,000 but less than $50,000	$42,500
At least $50,000 but less than $75,000	$62,500
At least $75,000 but less than $100,000	$87,500
At least $100,000 but less than $150,000	$125,000
$150,000 or more	$1,000,000
Don’t know	System Missing
Prefer not to say	System Missing
System Missing	System Missing

Appendix G: Research Question 2: ANOVA Table for Remaining Five Models

One-Way ANOVA Table for the Models for Each Combination of Independent variables (cases with no significance) and Financial Literacy Score (Dependent Variable)

	Source	*df*	*SS*	*MS*	*F*-ratio	Sig.
Model 3						
	Between groups	3	3,721.40	1,240.47	1.61	0.211
	within groups	27	20,830.58	771.50		
	total	30	24,551.97			
Model 4						
	Between groups	2	3352.52	1676.26	2.214	0.128
	Within groups	28	21199.45	757.12		
	Total	30	24551.97			
Model 5						
	Between groups	2	3486.33	1743.17	2.317	0.117
	Within groups	28	21065.64	752.34		
	Total	30	24551.97			
Model 6						
	Between groups	2	3541.27	1770.63	2.36	0.113
	Within groups	28	21010.70	750.38		
	Total	30	24551.97			
Model 7						
	Between groups	1	347.22	347.22	0.427	0.518
	Within groups	34	27,638.89	82.91		
	Total	35	27,986.11			

Note. *df* = degrees of freedom, SS = sum of square, MS = mean square, Sig. = significance (two-tailed).

Note. Independent variables for each model: 3) Personal Income, Poverty, and Unemployment, 4) Personal Income and Unemployment, 5) Poverty and Unemployment, 6) Personal Income and Poverty, 7) Unemployment.

Appendix H: Research Question 2: Multiple Regression Table for the Remaining Five Models

Multiple Regression for the Models for Each Combination of Independent variables (cases with no significance) and Financial Literacy Score (Dependent Variable)

	B	Standard error	β	sr_i^2	t	Sig.
Model 3						
Constant	2.089	1.253			1.826	0.079
Personal income	1.5E-05	0.000	0.170	0.011	0.552	0.586
Poverty	-0.694	1.004	-0.206	0.017	-0.691	0.495
Unemployment	-0.388	0.804	-0.091	0.009	-0.483	0.633
Model 4						
Constant	25.481	9.939			2.564	0.016
Personal income	0.001	0.000	0.339	0.108	1.835	0.077
Unemployment	-5.322	13.171	-0.075	0.006	-0.404	0.689
Model 5						
Constant	48.992	7.038			6.961	0.000
Poverty	-18.921	10.020	-0.336	0.113	-1.888	0.069
Unemployment	-8.600	12.674	-0.121	0.033	-0.679	0.503
Model 6						
Constant	34.683	19.348			1.793	0.084
Personal income	0.000	0.000	0.213	0.019	0.731	0.471
Poverty	-10.567	16.378	-0.188	0.015	-0.645	0.524
Model 7						
Constant	36.111	5.205			6.937	0.000
Unemployment	-8.333	12.571	-0.111	0.012	-0.654	0.518

Note. Independent variables for each model: 3) Personal Income, Poverty, and Unemployment, 4) Personal Income and Unemployment, 5) Poverty and Unemployment, 6) Personal Income and Poverty, 7) Unemployment.

Appendix I: Permission to Use National Financial Capability Study Data and Instrument

RE: Doctoral Research Permissions on Financial Literacy in Appalachian Kentucky

Mottola, Gary <Gary.Mottola@finra.org>

Thu 7/27/2017 5:18 PM

To: Tanya Noah <tanya.noah@waldenu.edu>;

Hi Tanya,

Yes, you have the FINRA Foundation's permission to use the data and surveys from the National Financial Capability Study in the manner you described below.

Good luck with your research, and please do send us a copy of your completed research study—I would love to read it.

Best regards,

Gary R. Mottola, Ph.D.
Research Director | FINRA Investor Education Foundation
1735 K Street NW
Washington, DC 20006
(202) 728-8351

From: Tanya Noah [mailto:tanya.noah@waldenu.edu]
Sent: Thursday, July 27, 2017 1:50 PM
To: Mottola, Gary
Subject: [EXTERNAL] Doctoral Research Permissions on Financial Literacy in Appalachian Kentucky

Attention Gary Mottola
FINRA Investor Education Foundation
1735 K Street, NW
Washington, DC 20006
gary.mottola@finra.org

Dear Sir:

I am a doctoral student in the School of Management at Walden University, and I am in the process of writing my dissertation titled *Financial Literacy in Appalachian Kentucky: A National Comparison.* This study is being conducted under the direction of my dissertation committee chaired by Dr. Steven Tippins, who can be reached at steven.tippins@waldenu.edu.

I have read the Terms and conditions provided by the FINRA Foundation athttp://www.usfinancialcapability.org/terms.php[usfinancialcapability.org] and those provided on the download page athttp://www.usfinancialcapability.org/downloads.php[usfinancialcapability.org]. However, I would like to personally seek your permission for use of your materials as described below. The request of permission is a standard, and I believe an important, suggestion by the IRB at Walden University.

I would like your permission to use the National Financial Capability Study: 2015 State-by-State Survey Instrument in my academic research study. I would like to use it both in print and through an online survey system. I would also like to seek your permission to use the data provided from the 2015 State-by-State Survey to complete the national comparison part of my academic research study. I will use both the survey and data under the following conditions with your permission:

I will use the survey and data only for my academic research study and any publications relating to this study.

I will include the copyright statement on all copies of the instrument.

I will send a copy of my completed research study to your attention upon completion of the study.

If these are acceptable terms and conditions, please indicate so by replying to me through e-mail at tanya.noah@waldenu.edu. I sincerely appreciate your time and consideration of my request.

Sincerely,
Tanya L. P. Noah
Walden University
School of Management
Doctoral Candidate