How does scarcity uniquely inform the financial motives and outcomes of middle-class, non-retired households?

by

Meghaan R. Lurtz

B.A., University of Kansas, 2008
M.A., Capella University, 2014

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

School of Family Studies and Human Services
College of Human Ecology

KANSAS STATE UNIVERSITY

Manhattan, Kansas

2019

Abstract

The 2016 Survey of Consumer Finances was used to investigate the impact of scarcity on the savings motives and debt of middle-class, non-retired households. This project adds to financial planning literature by incorporating previously unobserved variables, financial and time scarcity, in financial decision-making. Its use of the scarcity lens has also provided new insights for serving the middle-class with financial planning. Middle-class household decision-making was impacted by financial and time scarcity. Objective financial scarcity was related to increased odds of saving for basic needs and negatively related to saving for retirement. Objective financial scarcity was negatively associated with household debt, which can be attributed to credit constraints lenders want. Subjective financial scarcity was negatively associated with saving for retirement and at the same time positively associated with saving for esteem or luxury. Objective time scarcity was positively related to higher levels of household debt. Subjective time scarcity had a significant but mixed relationship with household debt. Financial planners and financial counselors working with the middle-class should consider the impact of scarcity for managing debt and shaping goals that will influence saving for retirement.

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Dedication

This is dedicated to my husband. I am spoiled rotten. Thank you for: cooking me dinner, reading this dissertation and its many drafts, supporting me, laughing with me, bringing me a glass of wine when writer's block kicked-in, hugging me when I cried (sad and happy tears), being patient with me, and always knowing this was possible…even when I did not. I love you.

Preface

In the book, *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*, authors A. W. Banerjee and E. Duflo refer to the poor as "barefoot hedge-fund managers." These authors, more than any others I have had the opportunity to read, I feel give true appreciation and respect to the lives, situations, and decisions of the individuals and families that they work with and study. This dissertation and hopefully future work will do the same for the individuals and families I study. For instance, I once heard a story about a woman who had just received her tax return. The financial advisor thought, we will start an emergency savings account. She thought, I am going to buy a TV. Her advisor was confused, how is buying a TV better than saving for the future? Yet, she had a more pressing concern on her mind, the safety of her children. She did not live in a safe neighborhood; buying the TV meant the children will stay inside, and safe. She and her advisor agreed, the TV was the right decision in this circumstance.

We are not irrational just because we fail to act in a way that ultimately smooths income over a lifetime. Nor are we doomed if, in a moment, we choose to satisfy an immediate concern over a future one. The decisions we make may be a result of who we are, but equally as important to those decisions we make, are the hands we have been dealt. When we practice or conduct research and overlook social, environmental, and other contextual factors that can contribute to outcomes, this leads to an incomplete picture. At its worst, these pictures lack empathy, and do not demonstrate an appreciation for the individual in his or her own place and time. If financial planning is a helping profession, and I believe it is, let's emphasize and commit to the importance of empowering and respecting our client's decisions and their varied backgrounds and environments, for they know themselves best, deserve respect, and should receive individualized advice that reflects their whole person and their whole situation.

Chapter 1 - Introduction

Interest in middle-class financial decision-making is not new. Numerous studies and many recent, popular books have focused on who the middle-class is, what they are doing (and not doing) financially, and what can be done. Yet, even with all of that has been written, warning and encouraging these households to do more with what they have (e.g., save and invest) the struggle has continued. A comprehensive, research-based book by Wolff (2017) investigating wealth trends in America over the past 100 years concluded the middle-class has "staggering" debt levels and a lack of asset diversification when compared to the rich. Previous studies on the middle-class savings and investment behavior unanimously agree that a lack of self-control is largely to blame (Griedsdorn & Durband, 2016; Rha, Montalto, & Hanna, 2006; Yuh & Hanna, 2010). Yet, is that the whole picture? Is having or not having self-control that simple? This investigation will take a broader perspective to understand and potentially better serve, the well-known behavioral finance issue of self-control. Incorporating environmental variables, such as financial and time scarcity, a new light and new respect may be shed on the way middle-class households make financial decisions.

Previous research by Hacker (2006) suggests that even before the financial fall out in 2008, the middle-class had been increasingly bogged down by the number and gravity of financial decisions they must make for themselves (e.g., jobs, insurance, retirement, health care). Recent research finds that individuals and families make very difficult health and financial decisions in scarce resource environments (Morduch & Schneider, 2017; Mullainathan & Shafir, 2013; Venn & Strazdins, 2017). The resource scarce environment disables individuals from being able to think through all of the consequences (options). Resource scarce environments also impair behavioral control (Mullainathan & Shafir, 2013; Spears, 2011). A general definition of

scarcity is any environment in which the demand on a resource (e.g., time, money, energy, calories) exceeds the available amount of that resource (Mullainathan & Shafir, 2013).

Assets and debts are the consequences spawned from financial behaviors like credit, saving, and paying bills on time (Xiao, 2010). Financial behaviors, in turn, have been thought to be predominately governed by time preference and knowledge. Recent evidence has also demonstrated that scarcity changed the way individuals think about the decision at hand (Mullainathan & Shafir, 2013). Experimental research conducted in India found that scarcity limited the options the decision-maker saw and impacted their ability to concentrate on the decision itself (Mullainathan & Shafir, 2013). Poverty essentially created a scarcity mind-set; a narrowed lens (Mullainathan & Shafir, 2013). This mind-set depleted executive function and caused poor financial decision-making (Spears, 2011). Poverty made the act of decision-making more difficult, especially for the poor, because each decision, even small, normal decisions had far reaching economic consequences (Mullainathan & Shafir, 2013).

More recent work focused on Americans in poverty found more examples of financial decision-making related to scarcity (Edin & Shaefer, 2015). Servon (2017) and Morduch and Schneider (2017) have both provided powerful qualitative explorations of how the middle-class has made and continues to make difficult financial decisions in "sometimes poor" environments. "Sometimes poor" households were those in which, not every month, but three to four months out of a year, needed more money than their income could provide (Morduch & Schneider, 2017).

Economists have long acknowledged that financial behaviors, like saving, are harder for the poor (Shefrin & Thaler, 1988) due to the required level of self-control. The middle-class class have more resources than the poor and may be able to carry out financial best practices.

Yet, why the middle-class fails to carry out financial best practices (Griedsdorn & Durband, 2016; Rha, Montalto, & Hanna, 2006; Yuh & Hanna, 2010), remains unclear. The scarcity lens enables researchers to broaden the application of behavioral life-cycle's self-control construct and apply it to the "some-times" poor, middle-class. Following Wolff (2017) and his work with the Survey of Consumer Finance (SCF), the current research defined the middle-class as members of the second, third, and fourth wealth quintiles. This project has used data from the 2016 SCF and looked at the savings motives and debt in middle-class households using behavioral life-cycle hypothesis (BLC) under a scarcity lens.

Financial scarcity has been linked to eating, shopping, and other financial behaviors like borrowing (Birkenmaider & Fu, 2016; Shah, Mullainathan, & Shafir, 2012; Spinney & Millward, 2010; Venn & Strazdins, 2017). Time scarcity has been found to impact the way we shop and eat (Duhigg, 2012; Jabs & Devine, 2006). Is it possible then that the experience of scarcity may also be changing the way consumers perceive their financial situation and in turn make financial decisions? Winchester and Huston (2015) found that only 2% of middle-class households are using a financial advisor and that having a financial advisor would help to combat issues with savings and debt decisions people are making when left to their own devices.

It is also important to note that what is meant by "financial-scarcity" and what is meant by "time-scarcity" has been difficult to define because of their relationships with social norms and context (Venn & Strazdins, 2017). A middle-class household in New York City looks different from a middle-class household in Kansas City (Fry & Kochhar, 2018). Yet, in either city, it is possible for that family to find themselves in a situation where expenses have exceeded income; i.e., financial scarcity. When a doctoral student's schedule surpasses the finite 24-hour day, this too is a form of scarcity. As such, a general definition of scarcity has been described as

simply having less of a particular resource than the required demand on that resource (Mullainathan & Shafir, 2013; Spears, 2011).

The scarcity lens is a recent theoretical development consistent with traditional economic theories dealing with future orientation and how people understand or interpret information (Gabaix & Laibson, 2017). Essentially, need focuses behavior. Previous work has found, for example, when retirement is closer people are more likely to be saving for it (Stawski, Hershey, Jacobs-Lawson, 2007). When a need is "scarce" it has a similar impact. The mind cannot think carefully, due to cognitive load, about the trade-offs of their possible options. As such, while focusing on the scarce resource individuals may exhibit more discounting of the future (Gabaix & Laibson, 2017). Moreover, the scarcity lens understands scarcity's impact on mental capacity in three ways: (a) willpower, (b) ego depletion, and (c) limited attention (Spears, 2011).

Theory	**Decision**	**Type of Scarcity**	**Mechanism**	**Behavior**
Effect of Time Preference (Economics)	Don't save	Financial scarcity		Impatient Decisions
Direction		←		←
Effect of Limited Attention (Scarcity)	Don't save	Financial scarcity	Attention is focused on scarcity	Inattention to other issues and stress
Direction		→	→	→

Figure 1.1. Economic and poverty models of decision-making adapted from "Economic Decision-Making in Poverty Depletes Behavioral Control," by Spears, 2011, B.E. Journal of Economic Analysis and Policy, 11(1), p. 4. Copyright 2011 by De Gruyter.

Figure 1.1 highlights this important distinction and characterization of the scarcity lens when compared to traditional economic theories. Note the difference in the directionality and mechanisms. In traditional economic theory impatient decisions lead to financial scarcity. Conversely, scarcity framework details how scarcity leads to inattention of other issues that may

look like impatient decision-making. Researchers investigating financial and time scarcity's influence over decision-making have pointed out that traditional economic theory may be at risk for omitted variable bias; specifically failing to control for these mechanisms (Mullainathan & Shafir, 2013; Venn & Strazdins, 2017). This finding is in line with the Behavioral Life Cycle theory wherein self-control, more than mental accounting and framing, not only helped to explain financial behavior, but also led to program development that improved savings behavior (Thaler & Benartzi, 2004).

Limited attention, one of the scarcity framework mechanisms, is highly relevant to the current study. Limited attention can impact anyone at any time, separating it out from scarcity's two other important mechanisms, ego-depletion and willpower which are primarily seen as only impacting those in poverty (Spears, 2011). Limited attention can influence decisions even if the decision-maker is not traditionally "poor" (Spears, 2011). Limited attention, as used by Spears 2011, is most similar to what has been discussed and described as "tunneling" (Mullainathan & Shafir, 2013). Tunneling is the negative side-effects of what is also referred to as focus. For example, imagine a deadline is quickly approaching. In order to meet that deadline, the individual hunkers down and focuses in on the one issue at hand, typically the one that feels most scarce, and gets the work done. Yet, this focus can also lead to failure because the extreme focus in one area causes inattention in other areas (Mullainathan & Shafir, 2013). Returning to the deadline example, the individual may be weighing the work deadline and the promise to meet his or her spouse for an important meeting. Breaking the promise to a spouse and foregoing the meeting may get the work done, but it may also lead to immediate anger and hurt on the side of the spouse. Further, as Mullainathan & Shafir (2017) point out, examples like this also have long-term impacts. For example, the employee might not lose his or her job because they met the

work deadline but choosing work may lead to trust issues and marital dissatisfaction. This becomes even more complicated and begins to truly look like failure when Mullainathan & Shafir (2017) point out that had the employee been given the choice up front between keeping the job or keeping his or her marriage, the employee would likely say the marriage. Thus, it cannot be understated that focus today can and often does influence future consequences and options and that those future consequences and options may not reflect true values and priorities (Mullainathan & Shafir, 2013). This mirrors almost exactly how the *Financial Diaries* authors Morduch and Schneider (2017) summarized what some middle-class households were doing to manage finances. Attempting to balance retirements, tuition, bills, and unforeseen expenses the households tunneled in a way that researchers came to describe as "now, soon, and later." Focused on the "now", such as paying a high utility bill, the "soon," the "later," like an emergency fund or saving for retirement, did not happen. The scarcity framework offers a way to understand middle-class behavior in a new light. The middle-class is not lacking in self-control. The middle-class are tending to their most scarce need in the "now" (e.g. paying a higher than normal utility bill) and putting off future-oriented activities (e.g. save for retirement) until "later" – even when they know adequate retirement saving is important.

What is perhaps even more troubling comes from Shah, Mullainathan, and Shafir (2012). A group of students were given the task to play two games simultaneously. The game was a variation on Angry Birds – tossing blueberries at waffles, and students were placed into one of three conditions: rich, poor, or rich in one game and poor in the other. In the instance when students were rich in one game and poor in the other, they did worse than the other groups, always poor or always rich. Students "tunneled" and neglected efficient strategies in which they could have made more points; i.e., using their resources (blueberries) in different ways

depending on whether they were rich or poor. Students in the mismatched condition, one game poor and one game rich, neglected the rich game. They focused on the poor game and employed a poor-game strategy across both games, ultimately leading to fewer overall points than students who had been poor in both games (Mullainathan & Shafir, 2013). This finding is troubling because it bears a striking resemblance to what the *Financial Diaries* researchers referred to as "sometimes poor." Middle-class family's poverty may not always be a year-round, all-encompassing issue. In fact, some research has demonstrated that middle-class households spent approximately one-third of the year with household earnings below the household's average (Morduch & Schneider, 2017). Middle-class families were very clearly only sometimes poor.

In summary, past research has set the stage for why and how to consider adding the scarcity lens to the questions of the middle-class', financial decision-making. The middle-class, more than ever before, is required to make and execute a myriad of difficult financial decisions with far reaching future consequences (Hacker, 2006). The middle-class is at risk of falling prey to limited attention, as the limited attention mechanism applies to all individuals, not just those in poverty (Spears, 2011). The middle-class may also regularly be experiencing an ebb and flow of scarcity, which has led to even more complex decision-making strategies (Shah et al., 2013; Morduch & Schneider, 2017).

This dissertation uses a scarcity lens in combination with behavioral life-cycle hypothesis to frame and examine how the middle-class are doing their best to optimize in resource-constrained environments. The overarching research question for this dissertation is, how does scarcity uniquely inform the financial motives for saving and debt outcomes in middle-class, non-retired households?

In order to investigate this question, the study begins with a review of assumptions and past literature in Chapter 2. Theoretical perspectives are then discussed. Following the theoretical review, relevant empirical literature is examined, and the research questions and hypotheses are presented. Methodology is reviewed in Chapter 3. Chapter 4 outlines the results of the study. Chapter 5 summarizes the results, discusses implications, and concludes the investigation.

Chapter 2 - Literature Review

This chapter proceeds in four sections. The first section outlines assumptions. The second section focuses on theory. An overview of the theoretical models precedes a more in-depth discussion of traditional economics, behavioral economics, and scarcity. A discussion of the scarcity lens and its connections to the aforementioned theories, specifically behavioral life-cycle hypothesis, and scarcity's unique contributions concludes the theory section. The third section begins with an overview on the middle-class and scarcity and continues with a deeper review of recent empirical research using or related to scarcity. Financial and time scarcity will be discussed separately along with the scarcity's three mechanisms. The third section concludes with a review recent empirical research on the dependent variables of interest, financial motivations and outcomes of the middle-class. The fourth section outlines the research questions, reviews theory, and specifies hypotheses.

Overview of Assumptions

Use of terms such as "present-oriented", "bad", "poor" or "irrational" used to describe decision-making have been purposefully avoided throughout this investigation. Middle-class families in this investigation will be thought of as navigating constrained decision-making environments to the best of their ability. Further, the goal of committing to such an assumption is important, not only because it demonstrates a respect and empathy for the middle-class, but also opens the door to financial planning services. The middle-class is an untapped market in need of financial planning services (Winchester & Huston, 2015; Rosenfeld, 2017). Moreover, setting the stage to believe that middle-class is fully able and even primed to accept financial advice, if delivered in a form respectful of their situation, makes this investigation that much more important, creative, sensitive, and insightful.

Overview of the Theory

It has long been established that individuals should make decisions to smooth consumption and act as to maximize expected utility over their lifetime (Magrabi, Chung, Cha, & Yang, 1991; Chavas, 2004). Yet, this is not what individuals do. Empirical analyses have demonstrated that individuals do not borrow, save, and then dis-save in order to smooth their consumption over their lifetime (Banks, Blundell, & Tanner, 1998; Wolff, 2017); nor do consumers always make a choice in current time which then results optimally in a future period. Behavioral Life-Cycle Hypothesis (BLC) posits that individuals fail to execute a normative approach to consumption because of self-control, mental-accounting, and framing errors (Shefrin & Thaler, 1988).

The scarcity lens is consistent with this descriptive theory because the scarcity lens recognizes the impact of self-control/willpower. This research has used framing of BLC to explore the ways in which scarcity could be a contributor to self-control issues. The scarcity lens together with BLC have the potential to present a more nuanced picture of self-control and decision-making by incorporating the ideas of limited attention, willpower, and cognitive control. For instance, a person on a diet is living in a scarce caloric environment. The scarce caloric environment leads to dreams about food and the individual may find it nearly irresistible in this environment to say no to his or her comfort foods. Is this person weak-willed if they give in? Do we think of them as their own worst enemy, their current-self sabotaging their future-self? No, and potentially none of the above. Scarcity was playing a role.

Researchers have found that when a financial-decision maker is in poverty the outcomes of their decisions are not solely the result of time-preferences (Mullainathan & Shafir, 2013). Scarce resource environments change the way preferences present, which often times can make

the decision-maker appear to be impatient and subject to hyperbolic discounting (Gabaix & Laibson, 2017). The scarcity lens may help researchers understand that the middle-class are more than just present-oriented, weakly-willed, or less intelligent when compared to the rich.

Theoretical Review

Traditional Economics

The Life-Cycle Hypothesis (LCH) states that individuals should plan to maximize their utility through a process of borrowing, saving, and dis-saving, smoothing consumption over a lifetime (Ando & Modigliani, 1963). Utility is maximized when the present and future values of consumption are equal; a person would consume an equal amount in every time frame. The power of this efficient and straightforward theory was that it coincided with other theory, such as human capital theory, and it was easy to understand (Deaton, 2005). LCH also allowed researchers to look at saving, not just consumption, and use net worth as a control variable. The theory is ideal for thinking about what people should do in order to prepare for not only when they retire, but how long they expect to live in retirement and the resources they will need.

The simplicity and efficiency of the theory also led to weaknesses. The theory does not handle a single individual holding heterogeneous preferences. Not all financial decision makers treat consumption and savings the same. People have different life circumstances and people have different goals. For instance, some consumers want to leave an inheritance or have precautionary savings just in case they live longer than expected. LCH also assumes that households all have access to credit. However, not all households have equal access to credit nor equal credit rates. Middle-class households have a dramatically different relationship with credit and borrowing when compared to the rich (Wolff, 2017). As useful as LCH is for direction and setting normative standards it could not explain why some households did not borrow, save, and

then dissave over their lifetime in such a manner that spread consumption equally over one's lifetime.

Behavioral Economics

The Behavioral Life-Cycle (BLC) hypothesis was a formal response to LCH (Shefrin & Thaler, 1988). A number of previous ad hoc solutions had been added to LCH in order to help the theory account for different scenarios or anomalies as they arose (e.g. bequests, utility functions change over time, expectations may differ for future income) attempting to help the theory fit observed behavior (Shefrin & Thaler, 1988). Conversely, Shefrin & Thaler (1988) took a slightly different approach and ultimately constructed a new theory, BLC. The theory is a descriptive theory that includes three important constructs: (a) self-control, (b) mental-accounting, and (c) framing. The goal of this theory was not to ascribe behavior but instead describe behavior.

BLC is important for this investigation because of how BLC's three constructs relate to middle-class financial behavior. For instance, BLC says that within an individual there is a "doer" and a "planner". The "doer" is the side of the individual that focuses on the present and the "planner" focuses on the future. The "doer" and the "planner" sometimes fight and when they fight self-control becomes an issue. Moreover, BLC is positing that a person may not be just present-oriented nor is a person always future-oriented and that the environment may cause of one of these two personalities to be more or less prominent which is in line with the scarcity research. In fact, Shefrin & Thaler (1988) point out that individuals with small budgets struggle with making savings decisions because the level of self-control needed to do so is so "costly" when compared to an individual or household with a larger budget. Middle-class households

experiencing bouts of scarcity will have a tougher time saving for future goals when the feel that, that same money is needed elsewhere.

The mental accounting construct relates to how individuals consider the principles of fungibility. Specifically, where LCH would state that $1 in a savings account is equal to $1 in a checking account, BLC mental accounting construct says otherwise. According to BLC the same amount located in different account will be treated differently (Shefrin & Thaler, 1988). Mental accounting is when individuals utilize rules of thumb for different accounts (Shefrin & Thaler, 1988). An example of this behavior may be, it is not okay to spend money that has been allocated to a savings account but it okay to spend money that is sitting in the checking account. Middle-class households may struggle to save (e.g. a potential self-control problem), but even if they have saved, they may not be efficiently spending out of and saving into different accounts in order to smooth consumption (e.g. the mental accounting problem).

Framing is also an important construct of BLC. Framing relates to "increments" of wealth and is tied to mental accounting (Shefrin & Thaler, 1988). The construct outlines the way in which the same amount of money is treated based on how the money has been received (Shefrin & Thaler, 1988). A person who receives a $500 lump sum is likely to save this money. Conversely, the person that receives five payments of $100 dollars each is likely to spend this money.

Scarcity

The scarcity lens is the most recent theoretical development bridging economics, behavioral economics, and psychology. It was developed in joint experimental effort by Mani, Mullainathan, Shafir, Zhao, and Shah (2012, 2013). The scarcity lens is consistent with behavioral economic theories (Gabaix & Laibson, 2017) and it details how scarce resources

impact decisions in three ways: (a) willpower, (b) ego depletion, and (c) limited attention (Spears, 2011). These three concerns all impact cognitive ability and working memory, and at times can be difficult to distinguish in practice (Spears, 2011). Using the scarcity lens adds to prior theoretical work in that it is the first to state that our environment further perpetuates a scarcity cycle. Choices and resulting outcomes in cognitively scarce resource environments have more far-reaching consequences than choices when cognitive resources are less constrained. Scarcity causes three cognitive inefficiencies.

Limited Attention. The first of the cognitive inefficiencies is limited attention or what is referred to by Mullainathan and Shafir (2013) as "tunneling." Whatever the scarce resource may be—time, food, or money— scarcity traps the mind. The mind is fixated on the scarce resource and this leads to an inattention of other life arenas and potential options. As pointed out by Mullainathan and Shafir (2013) as well as Ariely et al. (2009), there is a plethora of psychological literature on how the mind's creativity dwindles in circumstances where a person is under stress and constantly obsessing, consciously and unconsciously, about the scarce resource.

Limited Willpower. Limited willpower is more familiar to economists from the work by Shefrin and Thaler (1988) who pointed out that saving is a luxury for the poor due to the inordinate amount of willpower it takes to save when resources are so limited. Other famous psychological studies of willpower have been conducted about what types of food people choose after solving difficult puzzles, something sweet or something healthy (Baumeister, Bratslavsky, Maraven, & Tice, 1998). After focused time and effort spent solving the puzzle, individuals did not have the willpower to resist a sweet treat.

In scarce situations, willpower is hard to muster and even if it is mustered, it is then depleted and would need to be built back up. This fact, the ebbing and flowing of willpower, is important to real life financial decision-making as many financial decisions are made in combination. Deciding to fix the family vehicle, put money away for college, while keeping food on the table with the lights on in the house– each subsequent financial decision made in a financially scarce resource environment gets tougher and tougher to follow through on because with each decision more and more willpower is being depleted (Servon, 2017; Morduch & Schneider, 2017). If the poor are "barefoot hedge-fund managers" with the ability to creatively and uniquely manage the ubiquitous risk in their everyday lives (Banerjee & Duflo, 2011); then the middle-class may have the same ability, as suggested by the *Financial Diaries* book.

Limited Cognition. Limited cognition is simply the fact that when making lots of decisions or even a few difficult decisions at the same time—the mind has a difficult time doing those things all at once. In these situations, people often appear "impatient." For example, Gabaix and Laibson (2017) stated that hyperbolic discounting, "predicts that agents who are unable to think carefully about an intertemporal tradeoff—e.g., due to a cognitive load, manipulation, or the effects of alcohol – will exhibit more discounting…This prediction is closely related to the theory of cognitive scarcity" (p. 16). Individuals in a scarce resource situation may not only be battling the resource issue but may also be choosing between difficult trade-offs. Again, it is not hard to imagine a middle-class family trying to save for retirement, their child's education, and pay to fix the car.

Summary of Theory

The theoretical lens guiding consumer and household economics is once again changing; a person's financial decision-making is not only the result of preferences and knowledge.

Consistent with the BLC and its emphasis on self-control, scarcity research is demonstrating that outcomes may be influenced by the environment and its impact on cognitive resources. Acknowledging the impacts of scarcity, versus positing that preferences are malformed or unstable, has offered new insight to understand, respect, and suggest potential remedies to improve decision-making. The scarcity lens remains distinct by broadening the approach to and understanding of what may determine self-control.

Objectives

Difficult household finance situations and decisions are not equivalent to video game simulations of blueberries and waffles, but as Mullainathan and Shafir (2013) pointed out, the patterns of behavior regardless of the scarce resource are the same. The scarcity mind-set causes tunneling; i.e., giving limited attention to anything other than the scarce resource. Scarcity's greatest contribution to research is the recognition of limited attention. Recognizing limited attention changes the way researchers, practitioners, and policymakers may want to go about helping the middle-class to actually change their financial behaviors, and ultimately their financial outcomes.

Previous research using scarcity as a frame to investigate behavior has been conducted experimentally and qualitatively, and as a result, has not necessarily been generalizable. Thus, developing scarcity measures in a large, secondary data set will help researchers to include scarcity in future studies. Second, if scarcity has a uniquely significant relationship with financial motives and outcomes then perhaps greater insights and implications can be gleaned to inform how to help the middle-class.

Review of Scarcity-Focused Empirical Findings

This section will review empirical findings from research conducted using the scarcity lens as well as research conducted on the motivations and financial outcomes of the middle-class, that have predominately focused on the use of BLC and self-control. As such, this section will do two things. One, it will provide grounding for the introduction of the scarcity variables, the independent variables of interest, based on past work and availability of variables in the Survey of Consumer Finances (SCF). Second, dependent and control variables will also be discussed, selected and introduced based on past work using the SCF and BLC. This section will conclude with the research questions, a review of BLC and the scarcity lens, and proposed hypotheses.

Scarcity Defined

Studies utilizing the scarcity lens have been predominantly carried out experimentally or quasi-experimentally with populations that are neither representative nor generalizable to the American middle-class. However, a review of those studies will provide a more comprehensive view on how scarce resources are thought to and found to interact with decision-making. Based on these previous studies, scarcity will be defined in four ways: (a) the reality of financial scarcity, (b) the feeling of financial scarcity, (c) the reality of a time scarcity, (d) and the feeling of time scarcity. The following sections detail how this four-part definition has been developed.

Experimental Studies

Scarcity as a Separate Construct. The goal of a series of experiments by Mani et al. (2013) was to establish scarcity as its own separate construct, separate from potential stress effects. Researchers identified scarcity and its impacts on cognitive load and executive functioning using patrons of a New Jersey mall and sugarcane farmers, with small plots of land,

from Tamil Nadu, India. In the New Jersey shopper study, participants were divided into a poor group and a rich group based on actual income and given a scenario where they had to decide what to do about car trouble: (a) pay repairs in full, (b) borrow money to fix the car, (c) or put repairs off all together. In some instances, the car trouble was expensive ($1,500), while in the other instances the car trouble was less expensive ($500). While making these financial trade-off decisions, participants also completed intelligence and cognition tests. In the inexpensive scenarios the rich and the poor did equally well. In the difficult scenarios, the poor did worse than the rich.

The India studies involved 464 sugarcane farmers from 54 different villages. Farmers were given Raven's Matrices and the cognitive control tests pre and post-harvest to look for changes in cognitive ability before and after a scarcity event, i.e., before harvest. Researchers were also careful to account for extenuating seasonal and environmental effects testing multiple famers during the same time period, but in different growing/harvesting cycles. The India studies demonstrated that the scarcity event reduced cognitive capacity, even when controlling for stress before, after, and contemporaneously during a harvest cycle (Mani et al., 2013).

In both studies, high cognitive load diminished cognitive ability and control, which then impacted decision-making ability for the worse. These studies isolated scarcity as its own construct, separate from stress, and established the first link between financial scarcity and its impacts on cognitive load and therefore decision-making. Most importantly, these studies also shed light on the relationship between cognitive load and presenting preferences.

Cognitive Load and Preferences. In a comprehensive literature review, Deck and Jahedi (2015) evaluated psychological and economic studies that had investigated of the impact of cognitive load on tasks and decision-making ability (e.g., risk, mathematical ability, inter-

temporal choice, food choice, generosity, strategic behavior). From the literature they concluded that people under cognitive load do no better and often do worse than those not under some sort of cognitive load. Taking the study further, they standardized an approach to measuring cognitive load, and ran two experiments to review the aforementioned tasks and decision-making abilities.

In Experiment 1, 112 students from the University of Arkansas were asked to memorize a number and then complete tasks related to (a) arithmetic, (b) risk, (c) impatience, (d) and anchoring. At the end of the experiment, they were asked to recall the number, and if they did so successfully would be paid for the task. The numbers were either single digits or eight digit-long numbers and were randomly assigned to students. Experiment 2 included 87 different students from the University of Arkansas and focused on intertemporal choice. Students were again asked to memorize a number, single digit or eight digits long, but were now asked to make decisions related to: (a) money impatience, (b) consumption impatience, (c) immediate snack choice, (d) and delayed snack choice (Deck & Jahedi, 2015). Students in Experiment 2 also were not paid until a future date in order to give the study a realistic appeal.

Overall results from both studies confirmed that cognitive load, defined as memorizing longer numbers, did worsen performance and had impacts on arithmetic, anchoring effects, risk tolerance, and created greater impatience (Deck & Jahedi, 2015). These studies confirmed that cognitive load impacted mental functioning and reinforced previous findings that a person's time preferences (impatient versus patient) were related to the person's cognitive load.

Cognitive Function and Scarcity Mechanisms Impacting the Poor. In three carefully organized experiments, Spears (2011) focused on the scarcity framework's three mechanisms. The goal was to establish some differentiation between each mechanism and its individual

relationship with depleted cognitive function. The mechanisms are: (a) limited attention, (b) ego-depletion, and (c) limited cognition.

Limited attention can be thought of as multi-tasking – it is impossible to do two things at once. The brain focuses on the scarce resource and this leaves less of the brain available to give attention to other issues (Spears, 2011). Ego-depletion happens when a person must resist and use their willpower (Spears, 2011). Studies have shown willpower weakens with use (Baumeister, Bratslavsky, Muraven, & Tice, 1998). In a resource scarce environment resisting temptation is constant; willpower depletes quickly and may not be able to recharge effectively (Baumeister, 2003). Limited cognition or limited cognitive control is when working memory and executive control are compromised and it becomes difficult to think through potential trade-offs (Spears, 2011).

The first study on ego-depletion recruited participants from rural villages in Rajasthan, India. The ego-depletion study was conducted with 57 adult men who were unaware of the experiments hypotheses and were paid for their participation. The study had three parts. First, the men participated in a store game where they had to make economic decisions having been randomly assigned to a "rich" or a "poor" condition. "Poor" participants had to choose between items where the "rich" could afford both; the items themselves represented temptation and investments. After completing the game, participants then completed tasks of behavioral control. Tasks were a handgrip test and a "Stroop-like task" which requires executive function (Spears, 2011, p. 8). The traditional Stroop test (1935) asks individuals to respond to in a particular way to mismatches between what is written and what can be seen. A Stroop test card may have the word "yellow" written in blue ink, the participant would need to say blue in order to answer correctly. Participants in the Spears (2011) ego-depletion study who had been assigned to the

"poor" condition exhibited more ego-depletion. They did worse on the "Stroop-like task" and held the handgrip for less time than the participants in the "rich" condition.

The second study by Spears (2011) focused on limited cognition and further honed-in on the economic decision making of the poor. Surveyors traveled to two new villages each day selling "a package of two 120-gram bars of hand washing soap…the price was 60 percent discount off the retail price, so participants may have been tempted to take advantage of the special offer" (p. 14). One village was a richer village and one village was a poorer village based on census information.

Once in the village, surveyors sold the product door-to-door and completed 15-minute one-on-one interviews. The order of experiment operation was randomized; half of the participants squeezed the handgrip before the economic decision and half squeezed after. Trade-off thinking, choosing between currently known financial obligations and deciding if one wants to buy products, had greater impacts for the poor because "the same economic decision can represent a more conflicting trade-off…economic decision-making is more difficult in poverty than otherwise" (Spears, 2011, p.5). The ego-depletion and limited attention studies focused on individuals actually living in poverty, financial scarcity, and highlighted the mechanisms associated with scarcity in the physical sense; truly limited financial resources.

Secondary Data Studies

The third study, in the three-part investigation of each of Scarcity's three mechanisms by Spears (2011), was carried out using a secondary data set. A secondary dataset could be used because limited attention is a problem for anyone, not just those individuals living in actual financial poverty (Spears, 2011). As such, the focus on limited attention serves as a transition. Limited attention is a transition to discussing how scarcity has been considered in secondary

datasets. It is also serving as the reasoning behind looking for scarcity in the middle-class. The middle-class is not "in poverty" through limited attention scarcity may still have an impact on decision-making.

Cognitive Function and Limited Attention, a Scarcity Mechanism for All. Spears (2011) third study on the limited attention looked at scarcity in a more general population. Limited attention can be caused by any resource (e.g, time, finance, calories). The limited attention mechanism is seen when "[scarcity] would over-occupy a person's attention, reducing performance in important decisions or behaviors unrelated to money or wealth and potentially causing over-anxiety in financial decisions" (Spears, 2011, p. 5). Anyone can experience scarcity under this form, not just those living in poverty, like middle-class families managing work commitments, home life, and bills.

The third study on limited attention employed The American Time Use Survey (ATUS). ATUS is a representative survey of the American population; the study utilized data from 4,134 respondents. The study modeled mindless eating in the poor as a result of limited attention. Mindless eating has been linked or defined as a lack of behavioral control (Ward & Mann, 2000; Wansink & Sobal, 2007). The hypothesis for Spears (2011) was, if the poor are overly-taxed by needing to focus on their limited financial resources while shopping they will be less likely to resist mindless eating. The work by Ward and Mann (2000) demonstrated that after students had been under high cognitive-load they opted for high-calorie food (dessert). The study by Spears (2011) concluded there was a statistically significant difference between the poor group and the rich group. The poor group was more likely to engage in mind-less eating after shopping when compared to the rich group (Spears, 2011). The poor group focused on their financially scarce realities and that focus limited their ability to be mindful of other goals like healthy eating.

Research Questions

The research questions for this investigation will look at the financial motivations and outcomes of the middle-class. Assets and debts are the outcomes spawned from financial behaviors like credit, saving, and paying bills on time (Xiao, 2008). Motivation has a unique and powerful control over behavior (Azjen, 1991), and has been found to impact savings outcomes (Rha, Montaldo, & Hanna, 2006; Lee & Hanna, 2015).

Motivations

Research Question 1: How is financial scarcity in a household associated with savings motives based on Maslow's hierarchy of needs?

Research Question 2: How is time scarcity in a household associated with savings motives based on Maslow's hierarchy of needs?

Outcomes

Research Question 3: How is financial scarcity in a household associated with household debt?

Research Question 4: How is time scarcity in a household associated with household debt?

Measuring Scarcity

Each of the scarcity mechanisms and its impact on behavior has been discussed. This next section of literature will review and focus on how scarcity has been measured in secondary datasets. Scarcity has been defined objectively as well as subjectively. Scarcity has also been defined using financial and time information.

Subjective versus Objective Scarcity. Australian health and science researchers have used scarcity to look at health behavior in large, secondary data sets. The longitudinal and nationally representative Australian survey of Household Income and Labour Dynamics (HILDA) was used to look at both subjective and objective measures of financial and time

scarcity on healthy behaviors (Venn & Strazdins, 2017). HILDA provided a sample size of 15,931 individuals between the ages of 25 and 54, non-students.

Financial scarcity was first assessed using a self-assessment where respondents had reported they "felt" poor. Second, researchers used actual financial data and when respondents had "less than 80% of the median income" they were recorded as "low income" (Venn & Strazdins, 2017, p.100). The subjective time-poor measure was reported by indicating feelings of "being rushed." Objective "time poor" was identified when individuals had more than 70 hours a week of commitments. Findings were consistent with the scarcity framework, "both income and time scarcity reduce physical activity and, in some cases lead people to consume less fruit and vegetables, eat out more and eat more discretionary calories" (Venn & Strazdins, 2017, p.98). Their study has provided reason to look at time scarcity and financial scarcity independently. It has also established the importance of subjective and objective measures of scarcity, reinforcing the social construction of these measures.

Financial Scarcity. The reality of financial scarcity has been predominately defined by low income and/or extreme poverty (Spinney & Millward, 2010; Mullainathan & Shafir, 2013). Low income has sometimes been defined by the poverty line (Spears, 2011). At other times financial scarcity was above the poverty line but defined low-income as a percentage relative to median income (Venn & Strazdins, 2017 p.100). It is important to point out that, although each study has adjusted to their own population of interest, those that were not looking at extreme poverty usually set the financial scarcity mark somewhere between $50,000 and $70,000. This is noteworthy in that $50,000 to $70,000 also coincides with where individuals stop reporting additional happiness associated with income and it is where households seem to be less vulnerable (Gupta, Hasler, Lusardi, & Oggero, 2018; Kahneman & Deaton, 2010).

However, income has not been the only way to measure financial scarcity. A study reviewing the connection between obesity and economic insecurity using men's individual level data available in the National Longitudinal Survey of Youth, 1979 cohort defined economic insecurity in four ways: (a) probability of unemployment, (b) income drops, (c) volatility in income, (d) and a poverty probability identified by the Department of Health and Human Services (Smith, Stoddard, & Barnes, 2009). Results provided evidence that economic insecurity led to weight gain. This study was not framed with scarcity, yet its findings remain pertinent. Financial scarcity can be measured both subjectively and objectively.

It is also important to address why financial scarcity was not measured by wealth in this investigation. As noted above, prior research on financial scarcity has not considered wealth. This lack of consideration for wealth in prior studies may be driven by available data. For instance, the early experimental studies did not collect data on wealth (e.g., Mullainathan & Shafir, 2013; Spears, 2011). The absence of wealth could also be attributed to research genre (i.e., health literature may not consider wealth as often as financial planning literature) and research population (i.e. measuring wealth is not helpful). Another reason wealth was not used is theoretical. Behavioral life-cycle hypothesis states that people tend to act in a way that violates the principles of fungibility (Thaler & Shefrin, 1988). Focusing on income over wealth is an attempt to narrow the focus to money that would not already be ear-marked for another purpose (e.g., mental accounting).

Time Scarcity. The reality of time scarcity has been predominately defined by amounts of time spent in "commitments" (Strazdins, Welsh, Korda, Broom, & Paolucci, 2016). Committed time is the opposite of leisure time and includes time spent at work, time spent commuting to work, time spent running errands or tending to the needs of family members and

has also included volunteer time (Spinney & Millard, 2010; Strazdins et al., 2016; Venn & Strazdins, 2017). These studies incorporating a measure of objective time scarcity had access to either daily journals or averages of actual hours provided by the respondent across the different types of time (e.g. work, volunteer, exercise, etc.). The hourly amounts were then used to develop either thresholds or cut-off points; typically, "150% of the median total committed time" at the individual level. In one study, 150% of the median was equivalent to saying 81 hours per week was spent in committed time; with an average of 32 hours 18 minutes being spent at work included in the 81 hours (Strazdins et al., 2016). In another study the time-poor threshold was set at 70 hours a week being spent in committed hours (Venn & Strazdins, 2017).

Time scarcity has also been subjectively measured. In two instances, this was a measure of time intensity or how often the person felt rushed, ranging from never to always (Strazdins et al., 2016; Venn & Strazdins et al., 2017). In another study, time scarcity was subjectively defined as life-work balance and having the time to spend time with family or have fun (Spinney & Millward, 2010).

Combining financial and time scarcity has also been done in past literature (Spinney & Millward, 2010; Strazdins et al., 2015). Findings were consistent that households tend to have inverse relationships with time and money. Low-income households had more leisure time, whereas higher-income households had less leisure time.

Scarcity Operationalized

In the economics and financial planning literature, there has been little use of large-secondary data sets to explore scarcity and its impact on financial behavior. The few studies that have addressed scarcity using a large secondary data set have been outside of financial planning.

These studies defined scarcity in terms of finances and time using a number of different variables depending on the dataset.

Objective financial scarcity has been determined using income (Venn & Strazdins, 2017). The subjective measures of financial scarcity were developed using variables from the NLSY-79, specifically, income volatility (Smith, Stoddard, & Barnes, 2009). Objective time scarcity has been measured using time use surveys (Venn & Strazdins, 2017). Subjective time scarcity has been measured using dissatisfaction with life-work balance (Spinney & Millward, 2010) and the feeling of rushing (Strazdins et al., 2016).

Middle-Class Defined

The middle-class has been defined by three financial features. The three features are: (a) the household's income and or net worth falling into either the second, third, or fourth quintiles (Wolff, 2017), (b) the household's investable assets need to be lower than $500,000 (Wolff, 2013; Weller & Logan, 2009; Winchester & Huston, 2015), and (c) the household's use of credit (Wolff, 2013; Scott & Pressman, 2011). The middle-class has different relationship with credit when compared to the rich and when compared to the poor.

The poor have restricted access to credit. The rich may have unrestricted access to credit, but a number of studies have shown that they do not utilize it and instead prefer to self-finance (Wolff, 2013). The middle-class have access and use consumer credit to finance homes, cars, and other aspects of their lifestyle in a way that many studies have found dangerous (Wolff, 2013; Scott & Pressman, 2011). In fact, Pressman and Scott (2009) demonstrated that by subtracting debt payments from income an additional four million Americans were then considered in poverty and therefore concluded that many members of the middle-class are "debt poor." Another study even found that use of credit, for education and home-buying, was not a

universally supported strategy wealth accumulation (Leitz, 2004). The research by Leitz (2004) found only when current mortgage debt was less than 80% of the home value was it related to higher relative net worth. In terms of higher education, higher relative net worth was only associated with having completed higher education without student debt (Leitz, 2004).

Dependent Variables Defined

Moreover, the goal of this investigation was to use the scarcity framework to consider the financial motives and financial outcomes of middle-class households. Investigating financial motives will look at what middle-class households have indicated as savings goals using the SCF. The goal here is to identify any connections between those financial goals as motivations to save and relate those quantitative findings back to qualitative findings from Morduch and Schneider (2017). Investigating financial outcomes aims to understand the relationship between scarcity and household debt. The goal is to look at the impact of scarcity while holding other important factors related to household debt stable in order to isolate scarcity's impact.

Savings motives. Investigating motives may offer an interesting view of the middle-class and the potential impacts of scarcity. Morduch and Schneider (2017) stated that many middle-class families were less concerned with getting ahead and more concerned with holding steady. These findings are similar to recent work from Weinberg, Zavisca, and Silva (2017) who found working-class, young adults were more concerned with stability over new experiences and consumption goals such as travel.

The Survey of Consumer Finances saving's motives question has been well-researched. A study using Maslow's hierarchy of needs framework found that households with savings goals above basic needs, were more likely to have saved (Lee & Hanna, 2015). Xiao and Noring

(1994) also found that savings motives differed based on the various needs perceived by the consumer. DeVaney, Anong, and Whirl (2007) found that the likelihood of household moving up from saving for safety to a higher-order savings goal like security or luxury was related to longer planning horizons, education and health, but not income.

This study will look at savings motives in the same way Lee and Hanna (2015) looked at savings motives using Maslow's hierarchy of needs, and further investigate some of their more nuanced findings. For example, Hypothesis 2 of the Lee and Hanna (2015) investigation was not supported; "basic needs were not significant, while esteem/luxuries had a negative impact on the likelihood of savings" (Lee & Hanna, p.139). Perhaps this discrepancy can be explained or understood with greater clarity through the lens of scarcity. Households with a higher level of scarcity may focus on different savings goals compared to households with less scarcity. Scarcity captures the mind (Mullainathan & Shafir, 2013) and has qualitatively been related to a focus on current stability over future upward mobility (Morduch & Schneider, 2017).

Household debt. High consumer debt is a marker of the middle-class. Wolff (2013, 2016) found that the debt-to-income ratio for the middle-class is dangerously high. Scott and Pressman (2011) pointed out that when households begin to pay off their debt, and in turn reduce spendable income, the middle-class is squeezed particularly hard. Winchester and Huston (2012) emphasized that a specific concern for the middle-class, when it comes to a reason why they should seek out financial advice, stems from a need for cash and debt management. The use of household debt brings together scarcity, financial planning, and household financial-decision making which is important for the potential conclusions and implications of this study.

BLC and Other Independent Variables

BLC, as previously stated, will be used to support the application of the scarcity framework. This support is specifically important for identifying and justifying important independent variables and control variables. This selection and discussion covers independent and control variables motivated by BLC and past work using the SCF.

Financial Knowledge. Many studies have found that the United States has incredibly low levels of financial knowledge (Lusardi & Mitchell, 2014a) and these low levels of financial knowledge are linked to debt, retirement preparedness, and more recent work has even linked low levels of financial knowledge to wealth inequality (Lusardi, Michaud, & Mitchell, 2015). Yet, knowing and believing, may be two different concepts. For instance, many people may agree that they should save or save more. Yet, at the same time, as witnessed by the low levels of financial knowledge, maybe they do not know enough to know how to get started saving or how to evaluate their budget to create opportunities for savings. This research will not measure beliefs, but it will measure knowledge, as financial knowledge has been used in many financial outcome investigations.

Income shocks. This is relevant to a study of scarcity because it has been used in past research to subjectively define scarcity (Smith, Stoddard, & Barnes, 2009). In this investigation, however, it was not selected to represent a presence of scarcity. Respondents in the SCF predominately select that their income was normal (Ackerman & Sabelhaus, 2012).

Age. Although no scarcity literature could be found pointing to different ages being related to scarcity, BLC theory clearly organizes the impact of the life-cycle on not only finances but time. For instance, younger people will be borrowing and saving, during school and working

years and older people will be spending and perhaps nearing retirement and therefore have more time available to them (Ando & Modigliani, 1963).

Health status. Health status was included as previous studies looking at health behaviors and scarcity did include health status (Venn & Strazdins, 2017). If a person is in poor health, they may be less likely to engage in activity (Kaleta, Makowiec-Dabrowska, Dziankowska-Zaborszcyk, & Jegier, 2006) and certain activities may take longer to perform leaving them less time in the day for other leisure activities (Crombie et al., 2004). Health status has also been used in financial planning literature to examine savings and portfolio selection (Dupas & Robinson, 2013; Rosen & Wu, 2004;), as well as who uses financial planning advice (Chatterjee & Zahirovic-Herbert, 2010).

Marital status and Gender. Previous literature has documented that marital status does have a relationship with financial outcomes such as savings; savings rates being higher for married couples (Browning & Lusardi, 1996). Further married couples may have a different relationship with scarcity as well. Married couples could have two earners and or married couples could find better or worse ways to divide up household chores, creating more or less time scarcity (Bosworth et al., 1991). Gender has been found to influence savings in low-income and moderate-income households (Fisher, Hayhoe, & Lown, 2015).

Homeownership. Owning one's home has been found to be related to financial outcomes. Homeownership has also been largely associated with debt (Wolff, 2010). Controlling for it will assist with the interpretation of the meaning of relationships of this and other predictors to the debt ratio.

Family size. Larger families may be more financial constrained as well as more time constrained if the children are small. Research has shown, for instance, that new parents often

change their spending and shopping patterns based on time and finances (Duhigg, 2012). In financial planning research on savings, the presence of children was related to decreases in saving (Lee & Hanna, 2015). Theoretical research has suggested that larger families or growing families will and should change the way that they save and use credit (DeVaney & Hanna, 1991; Hanna & Rha, 2000). Studies of time scarcity and sandwich generation issues point to the fact, that at least or especially for women, balancing children and aging parents can be very time consuming and negatively impact down-stream, financial decision-making (Bogan, 2015; Do, Cohen, & Brown, 2014; Evans et al., 2016; Friedman, Park, & Wiemers, 2017; Lumsdaine & Vermeer, 2015). Also, scarcity studies that rely on the official poverty line have implicitly involved household size because the poverty thresholds vary by household size, and in ways that are related to household equivalent consumption needs.

Net worth. Poverty thresholds used in some scarcity research (Spinney & Millward, 2010) focus on income. However, it is also important to account for assets and debts on the household balance sheet. For instance, having negative or positive net worth, impacted the way an individual viewed their wealth and potentially their decision to pay down debt or accumulate additional assets (Sussman & Shafir, 2012).

Race. Race is another common variable used in financial planning research. Different ethnic groups, due to differences in values, have perceived savings or other financial decisions in different lights (Lee & Hanna, 2015).

Household education. Education often moves with income, as education rises so does income, however it is common in financial planning literature to include both education and income. Education is sometimes viewed as a correlate for financial knowledge and it does have its own relationship with financial planning outcomes such as savings (Lee & Hanna, 2015).

Summary of Hypotheses

BLC says that individuals struggle with making savings decisions because the level of self-control needed to do so is "costly" (Shefrin & Thaler, 1988). The scarcity framework tells us that those individuals in resource scarce environments will often have lowered self-control or have depleted self-control due to limited cognition and tunneling (Mullainathan & Shafir, 2013). Further, given a general lack of self-control, based on both theory and framework, it can be hypothesized that individuals will tend to make less optimal financial decisions.

H_1: Financial scarcity will be negatively associated with Maslow's higher, hierarchal savings goals: basic needs, emergency savings, retirement, love/family, esteem/luxury, self-actualization.

H_2: Time scarcity will be negatively associated with Maslow's higher hierarchal savings goals: basic needs, emergency savings, retirement, love/family, esteem/luxury, self-actualization.

H_3: Financial scarcity will be positively associated with higher household debt.

H_4: Time scarcity will be positively associated with higher household debt.

Chapter 3 - Methods

This chapter presents the dataset and sample for the intended project. Each of the variables introduced earlier will be specified more exactly. The chapter concludes with the empirical models and the statistical approaches for each test.

Data

The dataset used is the 2016 Survey of Consumer Finances (SCF). The SCF utilizes a dual-frame sample design (Bricker, Bucks, Kennickell, Mach, & Moore, 2011). This included a "multi-stage area-probability (AP) and a list sample" (p. 4). Individual tax returns provided by The Statistics of Income (SOI) Division of the Internal Revenue Service determined the list sample. The list sample purposefully over-sampled the wealthy using "variables available in the SOI data" (p. 4). The National Opinion Research Center (NORC) determined the AP sample. The AP sample "comprises roughly 60 percent of the total sample, provide[ing] a broad national coverage and a sample of households selected with equal probability" (p. 4). The two samples combined represent U.S. households by year.

The population was primarily between the ages of 35 and 75 (Federal Reserve Bulletin, 2017). The number of families holding debt rose during this time, but the amount of debt decreased. More families reported paying bills on time and experienced less credit constraints when compared to 2013 (Federal Reserve Bulletin, 2017). Income and net worth were also up from 2013 numbers, "families throughout the income distribution experienced gains in average real incomes between 2013 and 2016, reversing the trend from 2010 to 2013" (Federal Reserve Bulletin, 2017, p.1).

Sample Characteristics

Respondents. Respondent and household level data was used consistently throughout the entire project. This is important as the respondent is the person who answered all of the interview questions in the SCF and should not be confused with the head of household (Lindamood & Hanna, 2007). The respondent is the individual who self-identifies as the "most financially knowledgeable" for a primary economic unit (PEU) (Hanna, Lindamood, & Huston, 2009). Household level data was used for financial totals like debt as well as determining a household total for hours worked.

Imputations. Missing data in the SCF was handled using the "multiple imputation" method (Lindamood, Hanna, Bi, Hogarth, & Getter, 2007). Each individual response was imputed five times. This means that for the 6,254 families interviewed there were 31,270 records created. All five implicates were used when completing the Ordinary Least Squares regressions using the "repeated-imputation inference" (RII). The "estimated variances" will be "more closely" representative of the true variances when compared to using only one implicate (Lindamood et al., 2007).

The results of the cumulative regression did not use the RII technique. Using SAS, RII was not able to be performed on the cumulative logit. As such, reporting of the cumulative logit mirrors that of the work by Hogarth, Anguelov, and Lee (2004) who were also not able to use RII due to technology issues. Lindamood, Hanna, and Bi (2007) in their paper on proper use of the SCF and RII techniques highlighted the Hogarth, Anguelov and Lee (2004) paper as an acceptable alternative to actual use of RII.

Each of the implicates was addressed separately, as seen in Table 2 below. Addressing each implicate separately allows researchers and readers to consider the nuances of each

implicate impacted the over-arching results. Further, similar to Hogarth et al. (2004), after all implicates were evaluated, a criterion was set for the parameter estimates. In Hogarth et al. (2004), a variable had to have significance of at least 0.05 in 4 of the 5 implicates to be considered a significant variable in reporting the results. This investigation is an exploratory investigation and therefore variables had to have significance of at least 0.1 in 4 of the 5 implicates to be considered significant.

Sample selection. The middle-class is defined as the three middle income quintiles. For 2016 the SCF income range corresponds to $26,329 to $214,173. Working households were defined by the question in the SCF that asks about work status. At least one member of each household had to be working to be included in the sample. The other member could be retired or not working. The descriptive analyses will be unweighted along with the analyses. Using a weighted analysis is often preferred for large datasets, like the SCF, that use a complex sample design, however, this is primarily for the ability to make results representative of U.S. households (Lindamood, Hanna, & Bi, 2007). This investigation is interested in looking into a sub-set of the larger U.S. population; middle-class, working households. As such, weights were not used for descriptive statistics nor analyses.

Measurement of Variables

Dependent Variables

Savings Motives. Savings motives in the SCF are based on the question, "Now, I'd like to ask you some questions about your attitudes about saving. People have different reasons for savings, even though they may not be saving all the time. What are your most important reasons for savings?" The SCF provides 35 categories for respondents to choose from. Like the research from Lee and Hanna (2015), this work will also organize the options based on Maslow's

hierarchy of needs: (a) saving for basic needs, (b) saving for emergency/safety, (c) saving for retirement/security, (d) saving for love/societal needs, (e) saving for esteem/luxury, and (f) saving for self-actualization. This investigation has used the same strategy.

Debt. Debt in the SCF is based on the list of debts, summed, pre-coded and provided by the Federal Reserve Board. Debts in this study are the sum of: (a) credit card debt, (b) lines of credit, (c) vehicle debt, (d) mortgage debt, (e) other real estate debt, (f), consumer debt, (g), business debt, and (h) other debt. Debt was transformed in order to address the extreme skew of this variable (Allison, 1999; Lawson & Heckman, 2017).

Independent Variables

Financial Scarcity. Financial scarcity was captured both subjectively and objectively. The objective measure of financial scarcity was determined by income. The median, middle-class income in the SCF is $72,909.82. As such, households below 20% of the median, the second quintile, have been labeled in "objective financial scarcity". Incomes between $26,328.55 and $54,682.50 fall into what is the second quintile. Incomes in the third quintile may also experience some scarcity, as such, they have been labeled "some scarcity". Households with incomes in the fourth quintile, were the reference group and were not considered in objective financial scarcity.

The feeling of financial scarcity was defined using three SCF questions. The first question was about spending in relation to income. Question x7510: "Over the past year, would you say that your (family's) spending exceeded your (family's) income, that it was about the same as income, or that you spent less than your income?" Reponses (exceed, same, and less) were coded into a binary variable. Exceeded income versus a response of same or below income indicated feeling financial scarcity.

The other two questions ask about volatility trends and expectations (X7366 and X7586). The volatility trend question is, “Do you usually have a good idea of what your (family’s) next year’s income will be?” The volatility expectation question is, “At this time, do you have a good idea of what your (family’s) income for next year will be?” Responses to both questions are binary. Yes, the respondent does experience and expects to experience volatility. Or, no, the respondent does not regularly experience nor expects volatility.

Time Scarcity. The SCF has questions about hours spent working at first jobs and second jobs for both the respondents and the spouses. For example, “How many hours (do you/does he/does she/does he or she) work on main job in a normal week?” Answers provided by the spouse and the respondent were combined to build a household-level, work-week total. The median household-level, work-week total was then found and households who had recorded work hours of an excess of 20% of that median total, 40 hours, were objectively considered time poor. As such, households spending more than 48 hours at work are considered objectively time poor. Households spending between 32 and 48 hours are considered to be objectively some-what time poor. Households spending less than 32 hours at work are not considered to be experiencing a state of time-poor.

Subjective time scarcity was defined by two questions. The two questions were about time spent making financial decisions. Questions x7100 and x7111 ask, “When making major decisions about [saving and investment/borrowing money or obtaining credit], some people search for the very best terms while others don’t. On a scale from -1 to 10, where -1 is no searching, 5 is moderate searching, and 10 is a great deal of searching, where would (you/your family) be on the scale?” If the respondent answered one to question x7100 about how much time they spend searching for borrowing money or obtaining credit, the respondent was

indicating that they spend “almost no searching.” This response was coded as scarcity (1), if they gave an answer between -1 and 5.

Health status. Respondents answered questions about their health status based on the question (x6030), “Would you say your (husband/wife/partner/spouse)’s health in general is excellent, good, fair, or poor?” Responses were turned into a three-part categorical variable. Excellent and good were combined. Fair and poor were left as fair and poor.

Family size. The size of one’s family was based on the question on the number of people in the primary economic unit (x7001).

Financial Knowledge. Previous work in the SCF has been concerned with measuring financial literacy. In fact, a financial sophistication proxy was developed for the SCF that did show individuals with higher financial sophistication was associated with high savings (Huston, Finke, & Smith, 2011). However, in 2016 financial knowledge questions, both objective and subjective, were added to the SCF. Subjective financial knowledge (x7556) asks, “Some people are very knowledgeable about personal finances, while others are less knowledgeable about personal finances. On a scale from 0 to 10, where 0 is not at all knowledgeable about personal finance and 10 is very knowledgeable about personal finance, what number would you (and your {husband/wife/partner}) be on the scale?” The continuous nature of the responses was retained.

Objective financial knowledge was determined using three questions (x7558, x7559, x7560). Each question was scored for correctness. For instance, question x7558 asks, “Do you think that the following statement is true or false: buying a single company’s stock usually provides a safer return than a stock mutual fund?” Reponses to this question were: (a) true, (b) false, (c) don’t know, (d) refuse. Responses of “false” were coded as correct, all other responses were coded as incorrect. Question x7559 was about earning interest in a bank account and

question x7560 was about interest rates and the impact of inflation. Once all correct answers were determined, a scale of objective financial knowledge was created. Three correct answers indicated high financial knowledge, two correct answers indicated medium financial knowledge, and one or zero correct answers indicated low financial knowledge.

Control Variables

Income shock/security. Income shocks were defined by two questions. The first question (X7366), "Do you usually have a good idea of what your (family's) next year's income will be?" If respondents reported "no" this response was then considered an indication of the household's income is usually insecure. The second question (X7586) asks, "At this time, do you have a good idea of what your (family's) income for next year will be?" If respondents reported "no" this response was then interpreted as an indication of the household's income being currently insecure. The SCF's traditional question about income shocks (X7650), "Is this income unusually high or low compared to what you would expect in a normal year or is it normal?" was not used as not many households indicate that their income was normal (Ackerman & Sabelhaus, 2012).

Age. Respondent age was recoded using the question (X14), "How old (are you/is [your spouse/partner/he/she/that person])? Age has been organized as a categorical variable with six specifications: under age 30, 30-39, 40-49, 50-59, 60-69, and age 70 or older. This is a critical control variable for consistency with the BLC approach.

Marital status. Marital status, the last of the categorical variables, was measured in four ways: married, couple, single-male, single-female. This variable was based on a combination of variables combining gender (x103/x8021) and status (x8023).

Homeownership. Owning one's home has been found to be related to financial outcomes. This variable was based on the question (x710), "Do you (and your family living here) own this (house and lot/apartment/ranch/farm), do you pay rent, do you own it as a part of a condo, co-op, townhouse association, or something else?" Response that the respondent does own the home were recorded as homeowners (1), all other responses were coded as non-homeowners (0).

Net worth and Assets. Net worth, similar to income, assets, and debts, is another summary variable. Including net worth is consistent with the life-cycle aspect of BLC in that it can range from negative values when dis-saving to the high values expected as an end-of life goal. Although age could capture that same pattern in a more general way, net worth serves as an additional and perhaps sharper way to delineate the context for BLC. To define net worth the assets in this study are the sum of: (a) homes, (b) other real estate, (c) automobiles, (d) liquid assets, (e) securities, (f) pension plans, (g) business equity, and (h) trust funds. Debts in this study are the sum of: (a) credit card debt, (b) lines of credit, (c) vehicle debt, (d) mortgage debt, (e) other real estate debt, (f), consumer debt, (g), business debt, and (h) "other debt. This list matches that of the Federal Reserve Board and it is a continuous variable.

Net worth was only included in the regression investigating financial motives. It was not included in the regression on household debt. Using net worth (assets-debts) to explain debt would raise endogeneity concerns. The regression looking at debt controlled for assets in lieu of using net worth to address this concern. Assets in this study are the sum of: (a) homes, (b) other real estate, (c) automobiles, (d) liquid assets, (e) securities, (f) pension plans, (g) business equity, and (h) trust funds.

Race. Race included four categories: White, Black, Hispanic, and Asian-other. Asian-other includes Pacific Islander, American Indian, Alaska Native, and Hawaiian Native.

Household education. A household level education variable was developed using the highest level of combined education within the household. The question, "what is the highest grade of school or year of college you completed?" was asked to both the respondent and of the spouse or partner. The highest of these was taken and recorded for the household: (a) high-school drop-out, (b) high school graduate, (c) some college, (d) bachelor's degree, (e) graduate degree.

Empirical Models

The primary goal of this investigation was to understand the potential impacts of scarcity on financial motivation for saving and debt in middle-class, working households. A cumulative logit was used to investigate hierarchal savings motives. An Ordinary Least Squares regression was used to investigate the debt questions.

Model 1: Savings Motives

To investigate the impact of scarcity on a household's motives an ordered logit will be used. The SCF's question on motives has been organized into six categories of increasingly higher order needs based on Maslow's hierarchy of needs: (a) no reason to save, (b) basic needs, (c) emergency/safety, (d) retirement/security, (e) love/family, (f) esteem/luxuries, (g) self-actualization (Lee & Hanna, 2015). Ordered logits were chosen as the benefit is that the hypothesis tests are more powerful, and the interpretations are simpler (Allison, 2012). The model can be organized by the following equation:

$$F_{ij} = \Sigma^{j}_{m=1} p_{im}$$

Where F_{ij} is the probability that individual $_i$ is in the j_{th} category or higher (Allison, 2012) and "each F_{ij} corresponds to a different dichotomization of the dependent variable" (Allison, 2012, p. 165). The resulting model is a set of equations,

$$\text{Log } (F_{ij}/1- F_{ij}) = \alpha_j + \beta x_i \text{ where } j = 1,\ldots,J-1$$

The equations utilize a single set of coefficients, but each has a different intercept (Allison, 2012). It is hypothesized that scarcity will be associated with lower levels of saving motivations found at lower levels of Maslow's hierarchy.

Model 2: Debt

To investigate the impact of scarcity on the debt, a continuous dependent variable, an Ordinary Least Squares (OLS) regression was selected. The relationship can be organized by the following equation:

$$(\log)y_i = \beta_0 + \beta_1 X i_1 + \ldots \beta_p X_{ip} + \varepsilon_i$$

Where y is the logged dependent variable and $x_{i1,}\, x_{i2\ldots}x_{ip}$ are the independent variables. E is the error term. Debt was transformed in order to address the extreme skew of this variable (Allison, 1999; Lawson & Heckman, 2017).

Weighting

Weighting is an important issue with studies having utilized SCF data. The dual-sample design over-represents the wealthy (Kennickell, 2003; Lindamood et al., 2007). Income specifically, when used as a control variable, has been shown to bias results when weights were used (Deaton, 1997). As such, this study will use an unweighted multivariate analysis (Shin & Hanna, 2016; Lindamood, Hanna, Bi, Hogarth, & Getter, 2007; Deaton, 1997). Also given its focus on the middle-class, all demographic information presented and discussed will also be unweighted.

Chapter 4 - Results

A complete, unweighted descriptive statistics table is shown below (Table 1). Scarcity was indeed a concern for some middle-class, non-retired households. Objective financial scarcity included incomes between $26,329 and $50,632. Objective financial scarcity was an issue for 29.93% of households and some-what of an issue for another 37.31% of households where incomes were between $50,632 and $92,149. Objective time scarcity included work hours of over 48 hours per week. Objective time scarcity was an issue for 31.41% of households and some-what of an issue for another 59.47% of households working between 32 and 48 hours.

The median age of respondents was 46 years (SD = 6.61); the youngest was 19 and the oldest was 92. The median income was $72,910 with a median net worth of $122,290. Over half of these households were homeowners (60.78%) and either married (56.18%) or in a partnership (12.32%) with a median family size of two. Households in the middle-class were also predominantly White (67.78%), in good health (82.45%), and educated (73.42% had some college or more).

Households in the middle class scored an average objective financial knowledge score of two out of three (SD = .39); and their average subjective financial knowledge score was a 7 out of 10 (SD = .93). A little less than one-third of the households do not take the time to make borrowing decisions (30.66%); 40% of households do not take the time to research their savings decisions. A little more than one-fifth of the households in the middle class indicate that they "usually" do not have a good idea of next year's income; income is always insecure (23.98%). A little less than one-third (28.41%) feel that "at this time" they do not know what next year's income will be; income is currently insecure.

Further, knowing that income insecurity could be an issue for a number of households, it also makes sense to see the top two reasons for saving were retiring secure (40.04%) and having an emergency fund (32.35%). The median debt for middle-class, non-retired households was $58,800 (SD = $70,000).

Table 1: Sample Descriptive for Middle-Class, Non-Retired Households 2016 Survey of Consumer Finance (N=15,133)

Sample Descriptive

	Sample Proportion
Variable	
N=15,133	Full Sample
DV1: Savings Motives	
Can't Save	0.23%
No Reason	0.04%
Basic Needs	4.01%
Emergency	35.35%
Retire Secure	40.04%
Love and Family	14.12%
Esteem and Luxury	5.33%
Self-Actualization	0.01%
DV2: Debt*	$58,800.00
Age*	46
Income*	$72,910
Net Worth*	$122,290
Family Size*	2.00
Homeownership	60.78%
Financial Scarcity	
Objective	
Income Level 1 (Scarcity)	29.93%
Income Level 2 (Some Scarcity)	37.31%
Income Level 3 (No Scarcity)	32.76%
Subjective	
Always Insecure	23.98%
Insecure at the Moment	28.41%
Time Scarcity	
Objective	
Work Hours Level 1 (Scarcity)	31.41%
Work Hours Level 2 (Some Scarcity)	59.47%
Work Hours Level 3 (No Scarcity)	9.75%
Subjective	
No Time for Borrowing Decisions	30.66%
No Time for Savings Decisions	41.31%

Financial Knowledge*	
Objective	2.00
Subjective	7.00
Perceived Health Status	
Good	82.45%
Fair	15.03%
Poor	2.52%
Marital Status	
Married	56.18%
Partner	12.32%
Single Male	12.99%
Single Female	18.50%
Race	
White	67.78%
Black	14.81%
Hispanic	12.84%
Asian/Other	4.57%
Education	
Dropped Out of HS	6.35%
HS	20.23%
Some College	33.00%
Bachelor's	26.07%
Graduate	14.35%

Note: 2016 SCF Unweighted Analysis using all five implicates
*indicates medians were used instead of means/frequencies

Model 1: Savings Motives

As described in Chapter 3, Methods, each of the five implicates were taken into consideration. However, for viewing purposes, only implicate one can be seen in Table 2 below. A complete review can be found in the Appendix. Those variables that were significant, at a level of .1, in four out of five instances were considered to be significant for the model. A level of .1, over a more traditional .05, was chosen as this investigation was exploratory in nature.

Model Fit. As seen in Table 2, none of the implicates nor the base model pass the proportional odds assumption. This has a few explanations. One, there is something incorrect about the order. There could be no actual order to the savings motives, or the applied order could be imperfect. The order, developed by Lee and Hanna (2015), did comply with Maslow's hierarchy of needs. However, as previously noted in the literature review, not all of the findings from Lee and Hanna (2015) followed theory; "basic needs were not significant, while esteem/luxuries had a negative impact on the likelihood of savings" (Lee & Hanna, p. 139). The order could be an indication of an order issue.

Two, there is a methodological, or perhaps computational, issue to explain failing the proportional odds test. When there are many independent variables, in this investigation there were 33, and the sample size is large (15,311 or approximately 3,020 per implicate) the proportional odds test has been shown to reject the null hypothesis fairly often (Allison, 2012). In these instances, if the researcher believes in the order, the failure of the proportional odds assumption can be overlooked. This investigation has chosen to overlook this issue from a methodological issue but notes there could be possible conflicts with the Lee and Hanna (2015) construction of the categories and this conflict will be discussed in the discussion.

Turning to model fit, the R-Squared value for each implicate (.0255-.0271) was higher than the R-Squared value for the "Base Model" (.0238). As such, it does appear that adding in the scarcity variables has slightly improved the model fit. It is generally recognized that the model fit for the model was low. However, this is not of great concern as the model and interpretations of the results comply with theory. Further, this was an exploratory investigation and important results were still uncovered.

Results. Time scarcity was one of those important results as it is or was a previously unacknowledged variable in financial planning literature. The odds of a family experiencing some type of time scarcity being in a higher motive category were 1.3 times the odds of a family not experiencing time scarcity. This was the case for families experiencing extreme time scarcity, working more than 48 hours per week, and or those only experiencing a moderate amount of time scarcity, working between 32 and 48 hours. Hypothesis two was not supported, there was a relationship between time scarcity and savings motives, but it was for higher order savings motives over lower order savings motives.

Larger family sizes also had a positive relationship with saving for a higher order motive. The odds of a three or four-person family, as well as a five or six-person family, being in a higher motive category, rather than a lower category, was approximately 1.4 times the odds of that of a two-person family. The odds of a seven-person family or larger being in a higher motive category were approximately two times the odds of that of a family with only two members. These findings render Hypothesis 1 and, again, Hypothesis 2 incorrect. Having a family does impact time and money (Duhigg, 2012; DeVaney & Hanna, 1991), but apparently that impact was to save for higher order savings motives over lower order savings.

Health status also has a statistically significant relationship with reported savings motives. The odds of a person in poor health saving for a higher motive category, rather than a lower category, were .55 times the odds of that of a person in good health. There was a negative relationship with poor health and saving for a higher motive; this could be some support for Hypotheses One and Two, discussed further in the discussion. Being younger (34 years or less) was also negatively (.78) related to saving for a higher motive when compared to an older person (45-55). Education, in some instances, was positively associated (1.2) with saving for a higher motive category, over a lower motive, when compared to a person with at least some college.

Table 2: Cumulative Logit Analysis on Savings Motives

Variable (Reference Group)	Base Model		Implicate 1		Significance Across Implicates
	Estimate	Odds Ratio	Estimate	Odds Ratio	
Intercept 8	-4.8253		-5.0097		
Intercept 7	-2.9100		-3.0843		
Intercept 6	-1.5344		-1.6882		
Intercept 5	0.3628		0.2135		
Intercept 4	3.1238		2.9558		
Intercept 3	5.8492		5.7311		
Intercept 2	5.9796		5.8649		
Log Net Worth	0.0075	1.008^	0.0077	1.0080	
Homeownership	0.1451	1.156***	0.1227	1.1310	
Financial Scarcity					
Objective (No Scarcity)					
Income Level 1 (Scarcity)	-0.0261	0.9740	-0.0265	0.9740	
Income Level 2 (Some Scarcity)	-0.0665	0.936^	-0.0235	0.9770	
Subjective					
Always Insecure			0.0695	1.0720	
Insecure at the Moment			-0.0600	0.9420	
Time Scarcity					
Objective (No Scarcity)					
Work Hours Level 1 (Scarcity)			0.2381	1.269^	****
Work Hours Level 2 (Some Scarcity)			0.2468	1.28^	****
Subjective					
No Time for Borrowing Decisions			-0.0256	0.9750	

No Time for Savings Decisions			-0.0980	0.9070	
Financial Knowledge					
Objective	-0.0357	0.956^	-0.0379	0.9630	
Subjective	-0.0265	0.974**	-0.0340	0.967^	
Family Size (Two Members)					
Single	-0.0511	0.9500	-0.0947	0.9100	
3 or 4 members	0.3268	1.387***	0.3245	1.383**	*****
5 or 6 members	0.2975	1.347***	0.3098	1.363*	*****
7 or more members	0.6754	1.965***	0.6685	1.951*	*****
Perceived Health Status (Good)					
Fair	0.1130	1.12**	0.1089	1.1150	
Poor	-0.5991	0.549***	-0.5684	0.566*	*****
Marital Status (Married)					
Partner	0.0927	1.097^	0.1080	1.1140	
Single Male	0.0192	1.0190	0.0536	1.0550	
Single Female	0.0020	1.0020	0.0427	1.0440	
Age (45-54)					
Less than 35	-0.2195	0.803***	-0.2090	0.811*	*****
34-44	0.0151	1.0150	0.0204	1.0210	
55-64	0.1192	1.127**	0.1500	1.1620	
65 or older	0.1136	1.12^	0.1982	1.2190	
Race (White)					
Black	-0.1164	0.89**	-0.1330	0.8780	
Hispanic	0.0759	1.0790	0.0633	1.0650	
Asian/Other	0.1053	1.1110	0.0652	1.0670	
Education (Some College)					
Dropped Out of HS	-0.0505	0.9510	-0.0255	0.9750	
HS	0.1913	1.211***	0.2281	1.256*	*****
Bachelor's	0.2021	1.224***	0.2128	1.237*	*****
Graduate	0.1657	1.18**	0.1867	1.205^	
N	15,133		3,034/15,133		

MODEL FIT STATISTICS		
Proportional Odds Assumption	<.0001	<.0001
c Statistic	0.5680	0.5710
AIC		8117.7530
SC		8352.4410
*-2 Log L		8039.7530
R-Square	0.0238	0.0255
Likelihood Ratio	<.0001	<.0001

Source: Unweighted analysis of respondents in the 2016 Survey of Consumer Finances all five individual implicates.
Note: ^p < .1, *p < .05, **p < .01, ***p < .0001 **** significant at .01 in 4 of 5 implicates, ***** significant at .01 in all implicates. Base model did not utilize RII.

Validity Check of Savings Motives

The results of the ordered logit were in some ways insightful, but in other ways created more questions. For instance, why were both subjective and objective measures of financial scarcity insignificant? Why was time scarcity positively related to higher level savings motives? In order to understand or develop greater clarity around the characteristics of a household associated with a particular savings motives, regardless of an overarching hierarchal structure, three motives were selected to further identify trends or patterns as they relate to scarcity and other possible explanatory variables.

Basic Needs. When looking only at the reported decision to save for basic needs, being in financial scarcity was associated with 1.7350 times the odds of saving for basic needs, when compared to not being in financial scarcity. Being in time scarcity, extreme and moderate, was negatively associated with saving for basic needs (.5370, .4780), when compared to those that were not in time scarcity. Being a single-person household and those households with three-to-four members was negatively associated with saving for basic needs (.4430, .6180), when compared to a two-person household.

Retire Secure. When looking only at the reported decision to save for a secure retirement, objective financial scarcity (.6910) as well as some objective financial scarcity (.8390) was negatively associated with saving for retirement, when compared to not being in financial scarcity. Subjective financial scarcity also mattered; the odds of a household with always insecure income saving for a secure retirement was .7690 times the odds of a household without insecure income. Conversely, being in objective time scarcity, both extreme (1.994) and moderate (2.0040), was positively associated with saving for retirement, when compared to those not experiencing time scarcity. Being in a single-person household was also positively associated

with saving for retirement (1.4930), whereas, larger family sizes were negatively associated with saving for retirement (.7890, .5430), when compared to two-person households. Finally, being in poor health was associated with .4580 times the odds of saving for a secure retirement, when compared to being in good health.

Esteem Luxury. When looking only at the reported decision to save for esteem or luxury, some findings made sense, while others appeared to be opposite of what would have been expected. It made sense that the odds of a household with currently insecure income saving for esteem or luxury was .5630 times the odds of a household not currently experiencing income insecurity. It did not necessarily make sense that, being in some financial scarcity was associated with 1.404 times the odds of saving for esteem or luxury, when compared to not being in financial scarcity. Also, the odds of a household with always insecure income saving for esteem or luxury were 1.6360 times the odds of those households not experiencing income insecurity. Income insecurity was positively associated with saving for an esteem or luxury item, but negatively associated with saving for a secure retirement.

These validity checks have helped to develop a greater understanding of how scarcity may be more or less of an important variable given a specific savings motive. Lower income and those households living in objective time scarcity, were more likely to focus on basic needs or solving immediate needs which is consistent with prior qualitative findings like those found in *The financial diaries: How American families cope in a world of uncertainty* (Morduch & Schneider, 2017) and experimental finding from the original scarcity researchers, Mullainathan and Shafir (2013). Subjectively, financially scarce households also had a relationship with savings motives. Insecure income households did not report having saved for retirement but did

report having saved for esteem or luxury items. Time scarcity also had a relationship with specific savings motives; sometimes positive and sometimes negative.

Table 3: Binary Logit of Savings Motive

Variable (Reference Group) *N=15,133*	Savings Motives					
	Basic Needs		Retire Secure		Esteem Luxury	
	Avg. of Beta Estimates	Odds Ratio (Implicate 4)	Avg. of Beta Estimates	Odds Ratio (Implicate 4)	Avg. of Beta Estimates	Odds Ratio (Implicate 4)
Intercept 2 - Self-Actualization	-2.8660		-1.0930		-3.2168	
Log Net Worth	-0.0375	**0.9640**	0.0187	**1.0210**	-0.0264	0.9720
Homeownership	-0.0549	0.9300	0.2841	**1.3270**	0.1995	1.2670
Financial Scarcity						
Objective (No Scarcity)						
Income Level 1 (Scarcity)	0.5612	**1.7350**	-0.3960	**0.6910**	0.4438	1.4350
Income Level 2 (Some Scarcity)	0.2794	1.3870	-0.1849	**0.8390**	0.4548	**1.4040**
Subjective						
Always Insecure	0.3138	1.3740	-0.2413	**0.7690**	0.5398	**1.6360**
Insecure at the Moment	-0.3721	0.6950	0.1153	1.1260	-0.6195	**0.5630**
Time Scarcity						
Objective (No Scarcity)						
Work Hours Level 1 (Scarcity)	-0.6144	**0.5370**	0.7393	**1.9940**	-0.4573	0.5390
Work Hours Level 2 (Some Scarcity)	-0.7545	**0.4780**	0.7203	**2.0040**	-0.2981	0.6430
Subjective						
No Time for Borrowing Decisions	0.2245	1.2860	-0.1324	0.8690	0.3141	1.3610
No Time for Savings Decisions	0.3445	1.4440	-0.0674	1.0790	0.0239	1.0460
Financial Knowledge						
Objective	-0.1221	0.9040	0.1786	**1.1990**	-0.0809	0.9100
Subjective	0.0239	1.0230	-0.0068	0.9990	0.0670	1.0660
Family Size (Two Members)						
Single	-0.8063	**0.4430**	0.3963	**1.4930**	0.6487	1.7800
3 or 4 members	-0.4736	**0.6180**	-0.2577	**0.7890**	-0.1436	0.8550
5 or 6 members	-0.4259	0.6300	-0.6320	**0.5430**	-0.4874	0.6640

7 or more members	-0.3314	0.7060	-0.5910	0.5580	-0.0591	0.9310
Perceived Health Status (Good)						
Fair	0.1023	1.1430	-0.0533	0.9560	0.3419	1.3880
Poor	0.6787	2.0350	-0.7255	**0.4580**	-0.4057	0.6840
Marital Status (Married)						
Partner	-0.1021	0.9280	-0.1714	0.8520	0.5628	**1.7690**
Single Male	0.7340	**2.1360**	-0.0656	0.9340	-1.0931	**0.3780**
Single Female	0.3656	1.4450	-0.3362	**0.7030**	-0.6860	**0.5600**
Age (45-54)						
Less than 35	0.1681	1.1720	-0.9505	**0.3810**	-0.2657	0.8080
34-44	-0.2455	0.7710	-0.5137	**0.5920**	0.0876	1.0550
55-64	0.1062	1.1000	0.3540	**1.3890**	-0.5653	**0.5530**
65 or older	0.5999	1.8850	0.1338	1.0890	0.5178	1.6180
Race (White)						
Black	-0.0859	0.9790	-0.2064	0.8290	-0.1838	0.9500
Hispanic	0.0205	0.9990	-0.2876	**0.7580**	0.0726	1.0900
Asian/Other	0.1557	1.1470	-0.2741	0.7710	0.4577	1.5860
Education (Some College)						
Dropped Out of HS	0.9481	**2.7790**	0.0573	1.0630	-0.0089	1.0180
HS	0.4259	1.6420	0.0831	1.0840	0.3498	1.4870
Bachelor's	0.2176	1.3230	-0.0230	0.9990	0.2448	1.2570
Graduate	-0.2282	0.8230	0.2606	**1.3090**	-0.1856	0.8820
MODEL FIT STATISTICS						
c Statistic	.707-.717		.721-.718		.687-.679	
Pseudo R-Square	.0235-.0223		.1405-.1360		.0238-.0215	

Source: Unweighted analysis of respondents in the 2016 Survey of Consumer Finances using RII. *p < .05, **p < .01, ***p < .0001

Debt

The results of the Ordinary Least Squares regression were obtained using RII techniques and can be seen below in Table 4. The F Test was significant (<.001) and the Adjusted R-Squared value was .22 (.2235-.2298), meaning the selected variables in the model explain 22-23% of the outcomes in household debt. This model lacks fit, but model fit was not the overarching goal of this investigation. Adherence to theory and exploring new ways to think about variables was the primary focus of this investigation. Moreover, acknowledging the poor model fit, the findings of this regression matter but need to be understood cautiously.

Before going through actual results, it is important to explain how the results are being reported. When the dependent variable has been logged transformed simply reporting the beta estimates can be challenging for interpretation purposes (Yang, 2012). Beta estimates have been reported in the table, but in the write-up of the results below results have been untransformed for ease of interpretation. The equation to un-transform a dependent variable is $100(e^{\beta 1} - 1)$ $100\beta_1$ (Woolridge, 2010; Yang, 2012).

The results of this regression helped to understand Hypothesis 3 and Hypothesis 4; is scarcity (time or financial) positively related to increases in household debt. The significant scarcity indicators in the regression were: objective financial scarcity, objective time scarcity, and subjective time scarcity. Debt was .42 times lower (-0.84 Beta estimate) for households experiencing scarcity (income level 1) compared to those households not experiencing scarcity (income level 3). Debt was be 3.4 times higher for time scarce households (working more than 40 hours per week) compared to non-time scarcity households. Debt was 3.2 times higher for somewhat time scarce households than non-time scarce households. Debt was .70 times lower for households experiencing subjective time scarcity as it relates to borrowing than those not

experiencing this type of subjective time scarcity. Conversely, debt was be 1.39 times higher for households experiencing subjective time scarcity as it relates to savings than those not experiencing this type of subjective time scarcity.

The findings surrounding financial scarcity do not provide clear support or dismissal for Hypothesis 3. For instance, it is possible to interpret that those households in the first income group ($26,329 and $50,632) do not have high enough income to get access to credit and take our larger debts such as buying a home or a new car. It has long been established that not all households have equal access to credit (Wolff, 2017). Moreover, these findings are consistent with past literature and demonstrate that financial scarcity does have a relationship with debt. However, the relationship was not a positive relationship. In this instance financial scarcity lowered debt.

Hypothesis 4, time scarcity being related to higher amounts of household debt, was mainly supported. Debt was 3.4 times higher for households experiencing high objective time scarcity and 3.2 times higher for those households experiencing moderate objective time scarcity when compared to households not experiencing times scarcity. Debt was also 1.39 times higher for those households who reported not having enough time to make savings decisions. Conversely, debt was .70 times lower for those households who indicated that they did not have time to think about borrowing decisions.

Table 4: Summary of OLS Regression Analysis of Debt

Summary of OLS Regression Analysis of Log of Debt

Variable (Reference Group) *N=15,133*	β	SE β	p
Intercept	5.01	0.85	<.0001
Log of Assets	0.25	0.06	**<.0001**
Homeownership	2.18	0.17	**<.0001**
Financial Scarcity			
Objective (No Scarcity)			
Income Level 1 (Scarcity)	-0.84	0.21	**<.0001**
Income Level 2 (Some Scarcity)	-0.24	0.19	0.20
Subjective			
Always Insecure	-0.09	0.19	0.62
Insecure at the Moment	0.10	0.17	0.56
Time Scarcity			
Objective (No Scarcity)			
Work Hours Level 1 (Scarcity)	1.24	0.28	**<.0001**
Work Hours Level 2 (Some Scarcity)	1.17	0.26	**<.0001**
Subjective			
No Time for Borrowing Decisions	-0.34	0.15	**0.02***
No Time for Savings Decisions	0.34	0.14	**0.01***
Financial Knowledge			
Objective	-0.11	0.08	0.17
Subjective	-0.02	0.04	0.65
Family Size (Two Members)			
Single	-0.77	0.26	**0.00****
3 or 4 members	0.14	0.16	0.37
5 or 6 members	0.35	0.24	0.15
7 or more members	0.79	0.24	0.15
Perceived Health Status (Good)			
Fair	0.07	0.18	0.68
Poor	0.47	0.41	0.25
Marital Status (Married)			
Partner	-0.14	0.21	0.51
Single Male	-0.20	0.28	0.47
Single Female	0.51	0.23	**0.03***
Age (45-54)			

Less than or equal to 34	0.51	0.20	**0.01****
35-44	0.42	0.18	**0.02***
55-64	-0.68	0.20	**0.00****
65 or older	-1.81	0.29	**<.0001**
Race (White)			
Black	0.57	0.19	**0.00****
Hispanic	-0.29	0.21	0.17
Asian/Other	-0.16	0.31	0.60
Education (Some College)			
Dropped Out of HS	-1.24	0.29	**<.0001**
HS	-0.83	0.19	**<.0001**
Bachelor's	0.23	0.17	0.18
Graduate	0.21	0.20	0.29
MODEL FIT STATISTICS			
Adjusted R2			.2235-.2298
F-Test			<.0001

Source: Unweighted analysis of respondents in the 2016 Survey of Consumer Finances using all five implicants. The results have been adjusted standard errors for complex sample design. Note: *p<.05, **p<.01, ***p<.0001

Chapter 5 - Discussion

The results of all of the regressions show that scarcity, in some shape or form, was related to middle-class savings motives and debt outcomes. However, in some cases, these results were opposite, or only partially correct, in terms of what theory was thought to have predicted. Hypothesis 1, financial scarcity will be negatively associated with Maslow's higher, hierarchal savings goals, was only partially supported. Hypothesis 2, time scarcity will be negatively associated with Maslow's higher, hierarchal savings goals, was only partially supported. Hypothesis 3, financial scarcity will be positively associated with higher debt, was not supported. Hypothesis 4, time scarcity will be positively associated with higher debt was partially supported. Moreover, although these results appeared to lack clear, decisive answers, there was still much to be gleaned from this investigation. A discussion of the nuances of the findings sheds light on how theory and the importance of recognizing scarcity was supported.

Financial Scarcity

From Chapter 2, Literature Review, financial scarcity was defined in both a subjective and objective manner. Objective measures were related to income. Subjective measures were related to "feeling poor" as well as the perception of income volatility. In prior literature, these measures of objective and subjective financial scarcity had been captured quantitatively as well as qualitatively and had been found to have a relationship with both financial and health behavioral motives and outcomes (Morduch & Schneider, 2017; Venn & Strazdins, 2017). Further, the subjective and objective measures of financial scarcity used in this investigation also had a relationship with savings motives and household debt. However, these relationships were, at least on the surface, not exactly aligned with theoretical interpretations.

Objective Financial Scarcity

In the cumulative logit the hypothesized measures of financial scarcity had no significant relationship with having savings motives at all. However, breaking down the cumulative logit and looking at three of the savings motives independently, significant results appeared. Objective financial scarcity, household incomes between $26,329 and $50,632, was positively related to saving for basic needs and negatively related to saving for retirement. These families were saving for the ability to: (a) buy durable household goods, appliances, home furnishings; hobby recreational items; buy things we need/want them; (b) meet contractual commitments; (c) ordinary living expenses bills; and (d) pay taxes. They were not saving for retirement/old age or the future and reported did not save just because they had extra income. These families were focused on the now and, consistent with theory, were overlooking future goals – not necessarily because of a general lack of self-control, knowledge or laziness, but, based on theory, because scarcity shaped their environment and therefore their resulting behaviors and decisions.

Objective moderate financial scarcity, household income between $50,631 and $92,150, was also significantly related to different savings motives. Yet, at least at first glance, the way these households were motivated to save was only partially supported by theory. Being in moderate financial scarcity was negatively associated with saving for retirement. They were not saving for retirement/old age or the future and reported that they did not save just because they had extra income. Yet, they were saving for esteem or luxury, a higher order savings motive: (a) second homes, (b) buying an additional car or boat, (c) home improvements/repairs, (d) travel/vacations, (e) to get ahead and advance their standard of living, or (f) wealth preservation and maintaining their lifestyle. As such, these families were still focusing on the now, esteem and luxury, and giving up saving for the future, retirement, which would be supported by theory.

However, the finding was still somewhat unexpected; esteem or luxury motives were a higher order savings goal over retirement savings, which would be inconsistent with the idea that non-immediate needs would also somehow or for some reason trump necessary future needs, like retirement.

The ebb and flow of scarcity in middle-class lives may be the issue. The ebb-and-flow of scarcity, as previously discussed, makes decision-making exceptionally difficult and confusing to understand from the onlooker's perspective (Shah, Mullainathan, & Shafir, 2012). For instance, qualitative research found a theme of "maintain" as a goal for middle-class households. Maintain was included in the "esteem luxury" category; maybe this is a basic need for middle-class households. Also, many middle-class households may need to do maintenance on their homes or buy a second or third family car, not out of esteem or luxury, but simply as a result of their situation. Moreover it is not that Maslow's hierarchy of needs is wrong nor is it that savings motives cannot be categorized by the hierarchy, but the different savings motives attributed to each level of Maslow's hierarchy may not be appropriate for all income classes when looked at in isolation; social norms and contexts shape reality. The failed proportional odds test may serve as a testament to the fact that the middle-class decision-making process has been impacted by objective financial scarcity in a way that would be supported by theory.

Objective financial scarcity also had a relationship with household debt. Objective financial scarcity was hypothesized to increase debt but results from the OLS found just the opposite. Middle-class households may rely on credit to get through short-term income shocks (Rutherford & Devaney, 2009), but looking at total debt emphasized the fact that middle-class households may not have equal access to "good" but often larger debts like home loans.

Subjective Financial Scarcity

Hypothesized measures of time scarcity had no significant relationship with having a savings motive at all in the cumulative logit, however, other significant variables may point to the potential that scarcity has still had an impact. For instance, family size and health did have a significant relationship with savings motives. Larger families, in the ordered logit, saved for higher order savings motives when compared to a two-person household. Whereas respondents in poor health, when compared to healthy respondents, saved for lower order savings motives. Larger families, may again, be saving to maintain, buy the second car, or update and fix their current homes, not because of esteem and luxury or an outright lack of self-control and laziness, but because these are basic needs as a result of their family structure. Poor health respondents and their savings motives follow theory; focused on their immediate health needs, they were not focused on the future, like retirement.

In the binary logits, the actual subjective financial scarcity measures had a significant impact. Commonly having insecure income was negatively associated with saving for a secure retirement but positively associated with saving for esteem or luxury. When income is routinely insecure people are acting according to theory, putting off future needs for immediate needs (even if some of those immediate needs do fall into esteem or luxury). Yet, what does it mean that when households, who are only currently experiencing financial scarcity, report having a negative association with saving for esteem or luxury? This could be the ebb-and-flow issue of scarcity again. Being in these households that do not always feel the pressure of financial scarcity, when they do feel it, they react. In this case they could be shying away from any extra expenses, perhaps captured in the esteem or luxury category, or they could still not be saving for esteem or luxury and instead just buying esteem or luxury items by other means. The research

from Morduch and Schneider (2017), for instance, noted the middle-class households were consistently experiencing a low-income month every three to four months and in these months, they would cut corners and rely on credit to get them through. As such, this somewhat oppositional finding may actually still fit or has been explained with the scarcity lens.

Subjective financial scarcity was not a significant variable in the OLS. Lack of significance could be related to looking at total debt as opposed to just consumer debt or just mortgage debt. The finding that objective financial scarcity was related to lower levels of overall debt speaks to the type of debt that lower-income households may or may not have access to (e.g., have access to credit cards but do not have as much access to a home loan). As such, the potential impact of subjective scarcity may be washed out when looking at total debts. Future studies would benefit by looking at consumer debt, mortgage debt, and total debt separately.

Time Scarcity

From Chapter 2, Literature Review, time scarcity was defined in both a subjective and objective manner. Objective measures were related to "committed" time. Subjective measures were related to feeling rushed as well as finding a balance for things one wants to do and what someone does not want to do. Moreover, like financial scarcity, past literature had found a connection between this type of scarcity and related health motives and behaviors. Further, the subjective and objective measures of time scarcity used in this investigation also had a relationship with savings motives and household debt. However, these relationships were not necessarily in line with theory.

Objective Time Scarcity

In the ordered logit, both moderate and extreme time scarcity were positively associated with saving for a higher motive category, when compared to those not experiencing time

scarcity. In the binary logits, both moderate and extreme time scarcity were negatively associated with basic needs and positively associated with saving for retirement. Thus, based on this account, time scarcity was good for getting people to think about the future, which could be seen in opposition to past work. For instance, time scarce individuals were more likely to eat fast food even when they knew fast food went against a future health goal such as actually being healthier (Spinney & Millward, 2010; Venn & Strazdins, 2017; Strazdins, et al., 2016).

However, there are possible explanations for this oppositional finding. The first stems from the fact that this investigation could only measure time scarcity in terms of work hours. Other studies had considered work hours in addition to other committed time. As such, this focus on time spent at work instead of general committed time could have skewed results about time scarcity as a whole. For instance, spending a lot of time at work, perhaps these individuals know that they do not want to work that much in the future and so they have focused on saving for their retirement. Also, spending a lot of time at work, perhaps these households perceived they were making enough money to save for retirement in addition to having the money they need to meet all their expenses. Essentially, these families do not need to save for what they can already afford.

Another explanation for this could be that some stress, time stress in particular, was helping individuals to focus. Research has shown that people are very motivated to save for retirement, the closer retirement appears to be; i.e., saving for retirement becomes or feels like their immediate need (Stawski, Hershey, & Jacobs-Lawson, 2007). This thought process is very similar to an approaching work deadline. The deadline focuses efforts and behaviors to meet that deadline. Scarcity research fully acknowledges that stress, at its lower levels, can have positive "focusing" effects (Mullainathan & Shafir, 2012). Thus, these finds are not wholly inconsistent

with scarcity theory, they may just be indicating extreme or detrimental levels of scarcity going from a focusing agent to a tunneling agent.

Objective time scarcity also mattered in the OLS. As a general statement, having time scarcity increased a household's debt level. There are two possible explanations for this finding. Households may be working more because they have homes and other large debts to pay for or it could be the inverse, working so much the consumer did not think through their debt decisions and in turn spent more than those households who did have time. The scarcity framework would point to the second interpretation where the environment shapes decision-making (Mullainathan & Shafir, 2012).

Subjective Time Scarcity

The selected measures of subjective financial scarcity only had significant relationship in the OLS and the direction of significance was inconsistent. This could be related to the measures. For instance, subjective measures of time scarcity in past literature were either actual scales of "feeling rushed" or they were questions about how the respondent saw or enjoyed life-work balance (Spinney & Millward, 2010; Venn & Strazdins, 2017; Strazdins et al., 2016). The subjective measures in this investigation were two questions about how much time a respondent spends or has spent searching for information in order to make savings or borrowing decisions. Moreover, this investigation was attempting to consider the questions available in the SCF as questions of life-work balance; i.e., did respondents feel that they had the time they need or want to search for information regarding financial decisions.

Interpreting the SCF questions in this way required two assumptions, and these assumptions may have been the issue. One, not having time to make research financial decisions was a reflection of not having time in all aspects of one's life. Two, that people would indeed

want to take the time to do research for savings or borrowing decisions. However, from a human capital theory perspective, why would they spend their own time researching, a costly and risky activity, when they could outsource the research to a financial planner. As such, people in general may not want to spend their free-time searching for financial information. Nor is a lack of interest in one realm necessarily a sign of interest or ability to research in another realm; people may not want, and be theoretically justified to avoid, financial information searching but enjoy it for a hobby or other life realm. Moreover, these questions may not have been strong representations of subjective time scarcity in alignment with past work and this could explain why subjective time scarcity only showed up in the OLS.

Household Size and Health Status

Another way to consider subjective time scarcity, though, is in the statistically significant findings related to household size and health status. As discussed in the literature review, having a family, let alone having a larger family, was related to changes in consumer shopping habits (Duhigg, 2012). A change in a shopping habit is not necessarily representative of self-control or self-control being impacted, however, family size has a clear relationship with a person's reasons to save, as seen in this investigation, and having a reason to save (or not spend from the consumer habit perspective) impacts savings rates. Savings rates at least have the opportunity to increase if a family is not spending more or equal to their income (Lee & Hanna, 2012). From this perspective then, family size was potentially picking up on income scarcity (large families cost more), but also time scarcity as larger families have more members that require an individual's time.

In the ordered logit, larger family sizes were associated with higher odds of saving for a higher order motive. In the binary logits, larger families (three to four person) were negatively

associated with saving for basic needs as well as negatively (three to four and five to six person) associated with saving for retirement when compared to two-person families. In the OLS, a single-person household had lower debt when compared to a two-person household. Given these three references to work from, time scarcity may be at play. These families have enough money that they do not necessarily need to focus on basic needs, but they are not, at the same time, focusing on retirement either. As such, they may be focusing on another immediate issue or simply be attempting to maintain. Studies of time scarcity and sandwich generation issues point to the fact, that at least or especially for women, balancing children and aging parents can be very time consuming and negatively impact down-stream, financial decision-making (Bogan, 2015; Do, Cohen, & Brown, 2014; Evans et al., 2016; Friedman, Park, & Wiemers, 2017; Lumsdaine & Vermeer, 2015).

Health status had statistically significant results when looking at motives. In the ordered logit, poor health had a negative relationship with saving for higher motives. In the binary logits, poor health had a negative relationship with saving for retirement. Moreover, poor health has been found to have an impact on one's financial decisions and situations (Rosen & Wu, 2004; Smith, 1999). Yet, it might also be about time. If a person is in poor health, they may be less likely to engage in activity (Kaleta, Makowiec-Dabrowska, Dziankowska-Zaborszcyk, & Jegier, 2006) and certain activities may take longer to perform leaving them less time in the day for other leisure activities (Crombie et al., 2004). Health status may be used or could be considered as a potential stand-in for time and financial scarcity.

Limitations

There were a number of potential limitations to the current study. The first, and probably biggest, was model fit. The cumulative logit explained very little variance and the OLS only

explained about 22% of the variance in their respective dependent variables. Issues with the cumulative logit may stem from a truly unordered dependent variable in combination with un-tested scarcity variables. Issues with the OLS may also stem from the use of un-tested scarcity variables. Measures of scarcity remains in their infancy. This investigation has shed light on the measurement of scarcity, yet the issue remains that there has been no set way to measure and account for scarcity in a repeatable and reliable way. Finally, scarcity is relative spatially. A recent article published by Pew Research Center, interactively demonstrated the impact of geographical location on whether or not an individual could consider themselves in the middle-class when compared to their peers (Fry & Kochhar, 2018). Their study very clearly confirmed that middle-class households in New York City look very different than those middle-class households living in Kansas City. Moreover, the inability to control for geography was a limitation for the current investigation.

Future research will be able to reduce these limiting factors. For instance, this study or a similar study could be repeated with the National Longitudinal Survey of Youth or the Panel Study of Income Dynamics. These other large, secondary data-sets offer new or different potential measures to capture scarcity better. As just one example, a major issue in this investigation specifically was objective time scarcity. In previous work time scarcity included time at work, but also work in terms of chores, volunteering, and spending time with kids. Capturing in-home work and out-of-home work for both spouses could and likely will significantly impact time scarcity's relationship with outcome variables.

Use of other datasets also grants access to longitudinal data. Longitudinal data may allow for investigating how scarcity ebbs and flows and therefore changes decision-making in an individual household and actually establish causality, similar to the work from Venn and

Strazdins (2017). In regard to the relativity of scarcity and some of the findings in this study, hierarchal savings motives, qualitative investigations using smaller groups of individuals may help to parse and understand how families experience scarcity at a deeper, more nuanced level. Finally, in order to truly understand scarcity, after better more reliable measures are found, a Blinder-Oaxaca decomposition model would allow researchers to understand how much scarcity may be impacting decision-making compared to other components as predictors (Blinder; 1973; Oaxaca, 1973; O'Donnell & Owen, 2008).

Implications

Scarcity changes the way individuals and households think and behave, which should, in turn, change the way practitioners help individuals in scarce resource situations. Moreover, since time and financial scarcity were found to have significant relationships with savings motivations and debt, practitioners may want to consider new ways of recognizing scarcity but also handling it with clients. For example, it has already been established that the middle-class has different needs when it comes to financial planning, such as debt planning (Winchester & Huston, 2015). The scarcity framework or lens may help practitioners understand how to fill those needs.

For instance, another concept emerging from Mullainathan and Shafir's (2012) work is slack. Slack can come in many forms but at its core it is about trade-offs. If person or a client feels like they are constantly having to make trade-offs, forego the vacation in order to put more away in savings, this is a sign that scarcity is ultimately impacting decision-making. Although scarcity and the research surrounding it is still very recent and for the most part focused on finding scarcity and measuring its impact, Mullainathan and Shafir (2012) provided at least one idea for how to handle scarcity by focusing on maintenance to handle volatility.

Also there is much to be gleaned or considered from other studies related to self-control and choice-architecture. For example, a financial planning client may tell their advisor they must choose to put more into their savings and therefore cannot pay down their debt. However, a financial advisor could help them to run the numbers and help them to see they could do "both". Financial advisor have the knowledge and ability to take the time to revisit budgets and use new tools like those provided by Newcomb in the research-based book *Loaded* (2016). In *Loaded*, readers or financial advisors and their clients are advised to consider the emotional side of what they are saving or not saving and develop a greater connection and therefore a greater drive to accomplish their goals. Research from Morduch and Schneider (2017) as well as Sevron (2017), very clearly point out that middle-class families experiencing bouts of scarcity were very good at prioritizing and creatively finding ways to cut corners when they felt that their "need" was "now" and obviously important. Perhaps connecting these households emotionally to their budget goals, like using a tool from Newcomb (2016) would allow them to use their prioritizing and creative talents. Financial therapy research has found, as just one example, that solution-focused financial therapy works well for clients wanting to make a change through it use of the client's own strengths (Archuleta et al., 2015).

Financial advisors may also consider ways to "nudge" clients and help them to set-up their own nudges, so that the choice of A over B is already made for them by the nudge. A great example of this, is to help clients make a commitment today for how to handle their next raise, in the future. The now famous program Save More Tomorrow ™ by Thaler and Benartzi (2004) uses this strategy. Clients pre-commit to saving more in the future, so when the future arrives, they have already made the choice to save.

Financial advisors can also ask more questions. Research on what makes a decision-maker a "skilled" decision-maker, and or what an average, every day decision-maker needs to become a skilled decision-maker points to the need for deliberation (Cokely et al, in press). Financial advisor can help slow clients down and take them through some deliberation in regard to their financial choices. This does not mean point out how a client is wrong, but actually help clients to identify other options and take the time to weigh all the pros and cons. Financial advisors can help their clients from falling prey to both tunneling and the bandwidth tax, the two ways in which scarcity impacts decision-making, by sitting down and talking with them, asking more questions and generate additional ideas.

In closing, there is no perfect solution but recognizing scarcity and its potential impacts hopefully gives financial advisors and their clients more insight into the decision-making processes. Instead of thinking of clients as lazy or "bad" financial advisors may actually find that clients are in a scarcity trap and they do not even recognize it. The support and expertise of a financial advisor can then come into play to assist clients in escaping the scarcity trap and make positive changes in their financial lives.

Summary and Conclusions

The over-arching goals of this investigation were to investigate how to measure scarcity in a large, secondary data set and then consider those potential, and previously unidentified variables, in terms of savings motives and household debt. This investigation did uncover potential scarcity variables. These variables: objective financial scarcity, subjective financial scarcity, and objective time scarcity, do have a relationship with savings motives and debt in middle-class, working households consistent with Behavioral Life-Cycle Hypothesis and the scarcity lens. Future research on financial decision-making may want to consider these variables,

especially when considering or measuring, what may be impacting self-control. As such, it is not new that self-control matters in financial decision-making and resulting behaviors, but how scarcity is related to and perhaps responsible for some of the lack of self-control, is an important addition to the literature.

In practice, financial planners may be able to consider how easily noticeable characteristics like being a member of the "sandwich" generation, larger families, or health status may be an indication of scarcity at work. Financial planners can also lean on work from financial therapy, scarcity research, and behavioral life-cycle solutions to assist and support clients until more formal and specific solutions for scarcity can be developed.

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Appendix A - Code

```
LIBNAME data 'C:\Users\meghaan\Dropbox\SCF';

data data.scarcitydiss;
set data.SCFDissertationkeep;

/*******************
Limiting the Data Set
*******************/
income=income;
/*all households must have at least one working person*/
/*Working status of respondent. Categories are Unemployed, Part-time, Full-Time, and
Retired*/
if x8000=1 then respworking=x5111; else respworking=x4511;
if respworking=1 then respft=1; else respft=0; *respondent full-time;
if respworking=2 then resppt=1; else resppt=0; *respondent part-time;
if x8000=1 then do;
        if x6678=7 then respretired=1; else respretired=0; *respondent retired;
        end;
if x8000=5 then do;
        if x6670=7 then respretired=1; else respretired=0;
        end;
if respworking=0 and respretired=0 then respunemployed=1; else respunemployed=0; *responde
nt unemployed;

*Working status of spouse;
if x8000=1 then spworking=x4511; else spworking=x5111;
if spworking=1 then spft=1; else spft=0; *spouse full-time;
if spworking=2 then sppt=1; else sppt=0; *spouse part-time;
if x8000=5 then do;
        if x6678=7 then spretired=1; else spretired=0; *spouse retired;
        end;
if x8000=1 then do;
        if x6670=7 then spretired=1; else spretired=0;
        end;
if spworking=0 and spretired=0 then spunemployed=1; else spunemployed=0; *spouse
unemployed;

*working status of household;
if respft=1 or resppt=1 or spft=1 or sppt =1 then hhworking=1; else hhworking=0; *household
working;
hhretired=respretired; *household retired;
hhunemployed=respunemployed; *household unemployed;

run;
```

```
data data.scarcitysmall;
set data.scarcitydiss;

where income >=26328.55 and income<=214172.60 and hhworking=1;

/*all households must have at least one working person*/
/*Working status of respondent. Categories are Unemployed, Part-time, Full-Time, and
Retired*/
if x8000=1 then respworking=x5111; else respworking=x4511;
if respworking=1 then respft=1; else respft=0; *respondent full-time;
if respworking=2 then resppt=1; else resppt=0; *respondent part-time;
if x8000=1 then do;
        if x6678=7 then respretired=1; else respretired=0; *respondent retired;
        end;
if x8000=5 then do;
        if x6670=7 then respretired=1; else respretired=0;
        end;
if respworking=0 and respretired=0 then respunemployed=1; else respunemployed=0; *responde
nt unemployed;

*Working status of spouse;
if x8000=1 then spworking=x4511; else spworking=x5111;
if spworking=1 then spft=1; else spft=0; *spouse full-time;
if spworking=2 then sppt=1; else sppt=0; *spouse part-time;
if x8000=5 then do;
        if x6678=7 then spretired=1; else spretired=0; *spouse retired;
        end;
if x8000=1 then do;
        if x6670=7 then spretired=1; else spretired=0;
        end;
if spworking=0 and spretired=0 then spunemployed=1; else spunemployed=0; *spouse
unemployed;

*working status of household;
if respft=1 or resppt=1 or spft=1 or sppt =1 then hhworking=1; else hhworking=0; *household
working;
hhretired=respretired; *household retired;
hhunemployed=respunemployed; *household unemployed;

_imputation_=implic;
wgt=wgt;
nwgt=nwgt;

Income=Income;
if income <= 26328.55 then incomeQ1 =1; else incomeQ1=0;
if 26328.55 <= income < 50631.82 then incomeQ2 = 1; else incomeq2=0;
```

```
if 50631.82 <= income < 92149.91 then incomeq3 = 1; else incomeq3=0;
if 92149.91 <= income < 214172.60 then incomeq4 = 1; else incomeq4=0;
if income >= 214172.60 then incomeq5 = 1; else incomeq5=0;

if income > 0 then loginc=log(income);
else if income=0 then loginc=log(1);
else if income<0 then loginc=log(.01);

/*******************
Dependent Variables
*******************/
/*MOTIVES*/
/*Now I'd like to ask you some questions about your (family's)
        attitudes about saving and planning for the future.

        People have different reasons for saving, even though they may
        not be saving all the time. What are your most important
        reasons for saving?

        IF R SAYS THEY DON'T/CAN'T SAVE ASK:  If you were saving now,
        what would be the most important reason you would have to save?

        PROBE:  What else?

        TREAT 'SAVING' AND 'INVESTING' THE SAME.

            1.  Children's education; education of grandchildren
            2.  Own education; spouse/partner's education;
                education -- not known for whom
            3.  "For the children/family", n.f.s.; "to help the
                kids out"; estate
            5.  Wedding, Bar Mitzvah, and other ceremonies
                (except 17)
            6.  To have children/a family
            9.  To move (except 11)
           11.  Buying own house (code "summer cottage" in 12)
           12.  Purchase of cottage or second home for own use
           13.  Buy a car, boat or other vehicle
           14.  Home improvements/repairs
           15.  To travel; take vacations; take other time off
           16.  Buy durable household goods, appliances, home
                furnishings; hobby and recreational items; for
                other purchases not codable above or not
                further specified;  "buy things when we need/
                want them"; special occasions
           17.  Burial/funeral expenses
```

```
18.   Charitable or religious contributions
20.   "To enjoy life"
21.   Buying (investing in) own business/farm; equipment
      for business/farm
22.   Retirement/old age
23.   Reserves in case of unemployment
24.   In case of illness; medical/dental expenses
25.   Emergencies; "rainy days"; other unexpected needs;
      for "security" and independence
26.   Investments reasons (to get interest, to be
      diversified, to buy other forms of assets)
27.   To meet contractual commitments (debt repayment,
      insurance, taxes, etc.), to pay off house
28.   "To get ahead"; to advance standard of living
29.   Ordinary living expenses/bills
30.   Pay taxes
31.   No particular reason (except 90, 91, 92)
32.   "For the future"
33.   Like to save
40.   Don't wish to spend more
41.   To give gifts; "Christmas"
90.   Had extra income; saved because had the money left
      over -- no other purpose specified
91.   Wise/prudent thing to do; good discipline to save;
      habit
92.   Liquidity; to have cash available/on hand
93.   "Wealth preservation"; maintain lifestyle
-1.   Don't/can't save; "have no money"
-7.   Other
 0.   Inap. (/no further responses)*/


if x3006 in (-1,0) then Cantsave=1; else cantsave=0;
If x3006 in (31, -7) then NoReason = 1; else NoReason = 0;
If x3006 in (16,27,29,30) then BasicNeed = 1; else BasicNeed = 0;
If x3006 in (9,11,23,24,25,26,33,40,91,92) then ER = 1; else ER = 0;
If x3006 in (22,32,90) then RetireSecure = 1; else RetireSecure = 0;
If x3006 in (1,2,3,5,6,17,41) then LoveFam = 1; else LoveFam = 0;
If x3006 in (12,13,14,15,28,93) then EsteemLux = 1; else EsteemLux = 0;
If x3006 in (18,20,21) then SelfAct = 1; else SelfAct = 0;

Motive = .;
if (x3006=-1)or (x3006=0) then Motive=1; /*can't save*/
if (x3006=31) or (x3006=-7) then Motive=2; /*no reason*/
if (x3006 = 16) or (x3006=27) or (x3006=29) or (x3006=30) then Motive=3; /*basic needs*/
```

```
if (x3006 = 9) or (x3006=11) or (x3006=23) or (x3006=24) or (x3006=25) or (x3006=26) or
(x3006=33) or
(x3006=40) or (x3006=91) or (x3006=92) then Motive=4; /*ER*/
if (x3006 = 22) or (x3006 = 32) or (x3006 = 90) then Motive=5; /*retire secure*/
if (x3006 = 1) or (x3006=2) or (x3006=3) or (x3006=5) or (x3006=6) or (x3006=17) or
(x3006=41)then Motive=6; /*lovefam*/
if (x3006 = 12) or (x3006=13) or (x3006=14) or (x3006=15) or (x3006=28) or
(x3006=93) then Motive=7; /*esteemlux*/
if (x3006 = 18) or (x3006 = 20) or (x3006 = 21) then Motive=8; /*selfactualization*/


/*DEBT2ASSET*/
Debt=Debt;
Asset=Asset;

if asset <= 110790 then assetQ1 =1; else assetQ1=0;
if 110790 <= asset < 272740 then assetQ2 = 1; else assetq2=0;
if 272740 <= asset < 500600 then assetq3 = 1; else assetq3=0;
if 500600 <= asset < 946500 then assetq4 = 1; else assetq4=0;
if asset >= 946500 then assetq5 = 1; else assetq5=0;

/*levarage ratio; provided by FED macro documentation*/
 IF (DEBT >0 & ASSET > 0) THEN LEVRATIO=(DEBT/ASSET);
  ELSE IF (DEBT > 0 & ASSET=0) THEN LEVRATIO=1;
  ELSE LEVRATIO=0;



/*Financial Scarcity
X7366 Do you usually have a good idea of what your (family's) next year's income will be?
                1. *YES
                5. *NO*/

If x7366 = 5 then IncAlwaysInsecure = 1; else IncAlwaysInsecure = 0;

/*X7586 At this time, do you have a good idea of what your (family's)income for next year will
be?

                1. *YES
                5. *NO*/

If x7586 = 5 then IncCurrentInsecure = 1; else IncCurrentInsecure = 0;

/*Time Scarcity*/
/*X4110(#1)       NOT SELF-EMPLOYED:
X4710(#2)       How many hours (do you/does he/does she/does he or she)
```

```
            work on (your/his/her/his or her) main job in a normal week?

            SELF-EMPLOYED:
            How many hours (do you/does he/does she/does he or she)
            work in this business in a normal week?

            RECORD THE NUMBER OF HOURS (R/SP) WORKS IN A NORMAL
            WEEK, NOT THE OFFICIAL NUMBER OF HOURS (R/SP) IS PAID TO
            WORK.

            NUMBER OF HOURS:
               0.    Inap. (not doing any work for pay: X4105=5/
                     X4705=5; /no spouse/partner;
                     volunteer work not considered a job:
                     X7591=5/X7589=5)
            ********************************************************
              ORIGINALLY ALLOWED VALUES: [1,...,168]

              IF OUT OF RANGE: ILLEGAL VALUE ERROR MESSAGE

              IF >= 85: UNLIKELY VALUE ERROR MESSAGE
            ********************************************************/

/*second job*/
/*X4507(#1)      How many hours (do you/does he/does she/does he or she)
X5107(#2)      work on these jobs in a normal week?

            How many hours (do you/does he/does she/does he or she)
            work on this job in a normal week?

            NUMBER:
              -1.    None
               0.    Inap. (not doing any work for pay: X4105=5/
                     X4705=5; no spouse/partner; no
                     second job: X4501^=1/X5101^=1;
                     volunteer work not considered a job:
                     X7591=5/X7589=5)*/

/*hoh or respondent work hours*/
if x8000=1 then respMainJob=x4710; else respMainJob=x4110;
If RespMainJob >= 40 then RespMainJobScar = 1; else RespMainJobScar = 0;
If RespMainJob < 40 then RespMainJobOk = 1; else RespMainJobOk = 0;

/*spouse work hours - want spouse missing b/c of the highest hh*/
if x8000=1 then spMainJob=x4110; else spMainJob=x4710;
        if spMainJob^=0 then do;
```

```
If SpMainJob >= 40 then SpMainJobScar = 1; else SpMainJobScar = 0;
If SpMainJob < 40 then SpMainJobOk = 1; else SpMainJobOk = 0;
        end;
        else if spMainJob=0 then do;
                spMainJobScar=.;
                spMainJobOk=.;
                end;

/*max hh work, max statement tells it to take the highest level of the two
                values and if missing, just takes the one*/
HHMainJob=max(respMainJob, spMainJob);
        If HHMainJob <=32 then HHMainNoScar = 1; else HHMainNoScar=0;
        If 32 <= HHMainJob < 48 then HHMainSomeScar = 1; else HHMainSomeScar=0;
        If HHMainJob >= 48 then HHMainInScar = 1; else HHMainInScar=0;


/*income and time interaction dummies*/
if incomeq4=1 and HHMainNoScar=1 then NoScarcity=1; else NoScarcity=0;
if incomeq2=1 and HHMainInScar=1 then AllScarcity=1; else AllScarcity=0;
If incomeq2=1 and
HHMainNoScar=1 then LittleMoneyLotsTime=1; else LittleMoneyLotsTime=0;
If incomeq2=1 and
HHMainSomeScar=1 then LittleMoneyMedTime=1; else LittleMoneyMedTime=0;
If incomeq3=1 and
HHMainNoScar=1 then MedMoneyLotsTime=1; else MedMoneyLotsTime=0;
if incomeq3=1 and
HHMainSomeScar=1 then MedMoneyMedtime=1; else MedMoneyMedTime=0;
if Incomeq3=1 and
HHMainInScar=1 then MedMoneyLittleTime=1; else MedMoneyLittleTime=1;
If incomeq4=1 and
HHMainSomeScar=1 then LotsMoneyMedTime=1; else LotsMoneyMedTime=1;
If Incomeq4=1 and
HHMainInScar=1 then LotsMoneyLittletime=1; else LotsMoneyLittleTime=0;


/*X7561          (SHOW CARD 3)
        When making major decisions about borrowing money or
        obtaining credit, some people search for the very best
        terms while others don't.

        On a scale from zero to ten, where zero is no
        searching and ten is a great deal of searching, what number would you
        (and your {husband/wife/partner}) be on the scale?

        IF R SAYS "I DON'T BORROW", SAY: What did you do the last
        time you borrowed?
```

-1. *NO SEARCHING
1.
2.
3.
4.
5.
6.
7.
8.
9.
10. *A GREAT DEAL OF SEARCHING*/

```
If x7561 in (-1,1,2,6,4,5) then LowBorrow = 1; else LowBorrow = 0;
if x7561 in (6,7,8,9,10) then HighBorrow = 1; else HighBorrow=0;
```

/*X7562 (SHOW CARD 3)
When making saving and investment decisions, some
people search for the very best terms while others don't.

On a scale from zero to ten, where zero is no
searching and ten is a great deal of searching, what number would you
(and your {husband/wife/partner}) be on the scale?

-1. *NO SEARCHING
1.
2.
3.
4.
5.
6.
7.
8.
9.
10. *A GREAT DEAL OF SEARCHING*/

```
If x7562 in (-1,1,2,6,4,5) then LowSave = 1; else LowSave = 0;
if x7562 in (6,7,8,9,10) then HighSave = 1; else HighSave=0;
```

/*Financial Knowledge*/
/*Subjective Knowledge*/
/*X7556 (SHOW CARD 1)
Some people are very knowledgeable about personal finances, while others are less
knowledgeable about personal finances. On a scale from zero to ten, where zero is not at all

knowledgeable about personal finance and ten is very knowledgeable about personal finance, what number would you (and your {husband/wife/partner}) be on the scale?

-1. *NOT AT ALL KNOWLEDGEABLE ABOUT PERSONAL FINANCE
1.
2.
3.
4.
5.
6.
7.
8.
9.
10. *VERY KNOWLEDGEABLE ABOUT PERSONAL FINANCE */

SubFinKnow = x7556;
/*Objective Financial Knowledge*/
/*The next three questions are about your opinion on money and investments.

X7558 Do you think that the following statement is true or false: buying a single company's stock usually provides a safer return than a stock mutual fund?

1. *TRUE
5. *FALSE
-2. Don't know
-3. Refused

****
FOR THE PUBLIC DATA SET, CODE -3 IS COMBINED WITH CODE -2
****

X7559 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: more than $102, exactly $102, or less than $102?

1. *MORE THAN $102
3. *EXACTLY $102
5. *LESS THAN $102
-2. Don't know
-3. Refused

****
FOR THE PUBLIC DATA SET, CODE -3 IS COMBINED WITH CODE -2
****

```
X7560 Imagine that the interest rate on your savings account was 1% per year and inflation was
2% per year. After 1 year, would you be able to buy more than today, exactly the same as today,
or less than today with the money in this account?

                1.   *MORE THAN TODAY
                3.   *EXACTLY THE SAME AS TODAY
                5.   *LESS THAN TODAY
               -2.    Don't know
               -3.    Refused
             ************************************************************
               FOR THE PUBLIC DATA SET, CODE -3 IS COMBINED WITH
               CODE -2
             ************************************************************ */
If x7558 = 5 then stock=1; else stock=0;
If x7559 = 1 then interest=1; else interest=0;
If x7560 = 5 then inflation=1; else inflation=0;
ObjFinKnow = stock + interest + inflation;

/*Income Shock*/
/*Is this income unusually high or low compared to what you
        would expect in a "normal" year, or is it normal?

                1.   *High
                2.   *Low
                3.   *Normal*/

If x7650 = 2 then shock = 1; else shock=0;

/*age*/
*Age of respondent;
        If x8000=1 then respage=x19;else respage=x14;
        respagesq=respage*respage;
*dummies for age;
        *respondent;
        if respage<=34 then resplessthan34=1; else resplessthan34=0;
        if respage in (35:44) then resp35to44=1; else resp35to44=0;
        if respage in (45:54) then resp45to54=1; else resp45to54=0;
        if respage in (55:64) then resp55to64=1; else resp55to64=0;
        if respage>65 then resp65orolder=1; else resp65orolder=0;

/**********************
Health Status
**********************

X6030(#1)      Would you say your (husband/wife/partner/spouse)'s health in
```

```
X6124(#2)       general is excellent, good, fair, or poor?

                1.   *Excellent
                2.   *Good
                3.   *Fair
                4.   *Poor
                0.    Inap. (no spouse/partner)*/
if x8000=1 then resphealth=x6124; else resphealth=x6030;
if x8000=1 then sphealth=x6030; else sphealth=x6124;
if resphealth in (1,2) then goodhealth=1; else goodhealth=0; *good or excellent health;
if resphealth = 3 then fairhealth=1; else fairhealth=0;
if resphealth = 4 then poorhealth=1; else poorhealth=0; *fair or poor health;
/***************************
OTHER INDEPENDENT VARIABLES
***************************;
*sex & marital status;
*X8021(#1)      CODE SEX WITHOUT ASKING.  IF NECESSARY, SAY:
X103(#2)        I am required to ask your sex.
X109(#3)
X115(#4)        What is (your spouse's/your partner's/that person's) sex?
X121(#5)
X127(#6)          1.   *MALE
X133(#7)          2.   *FEMALE
X203(#8)          0.    Inap. (/no further persons);

*X8023(#1)      (Are you/Is your [RELATIONSHIP] currently married or
X105(#2)        living with a partner, separated, divorced,
X111(#3)        widowed, or (have you/has [he/she]) never been married?
X117(#4)
X123(#5)        (NOTE: if R lives with a partner who is financially
X129(#6)        interdependent, this variable is always coded '2' for the
X135(#7)        head and partner.  The legal marital status of R and of the
X205(#8)        partner are given by X7372 and X7018 respectively.)
X211(#9)
X217(#10)         1.   *MARRIED
X223(#11)         2.   *LIVING WITH PARTNER
X229(#12)         3.   *SEPARATED
                4.   *DIVORCED
                5.   *WIDOWED
                6.   *NEVER MARRIED
                0.    Inap. (person age 17 or less: No Further persons);*/

if x8000=5 then respsex=x8021;else if x8000=1 then respsex=x103;
respfemale=respsex-1;
if x103=x8021 then samesex=1; else samesex=0;
if x8000=5 then relation=x8023; else if x8000=1 then relation=x105;
```

```
if respsex=1 and (relation in (3 4 5 6)) then singlemale=1; else singlemale=0;  *single male;
if respsex=2 and (relation in (3 4 5 6)) then singlefemale=1; else singlefemale=0;  *single
female;
if relation=1 then married=1; else married=0; *married;
if relation=2 then partner=1; else partner=0; *partner;
if relation in(1,2) then couple=1; else couple=0; *couple (ie, married or partner);


/*X701          Now I have some questions about your home.

              Do you (and your family living here) own this (house and
              lot/apartment/ranch/farm), do you pay rent, do you own it as a
              part of a condo, co-op, townhouse association, or something
              else?

              IF THE PROPERTY IS OWNED THROUGH A TRUST THE
              PEU SET UP, TREAT IT AS OWNED BY THEM.

              NPEU IN THIS HOUSEHOLD:
              IF OWNERSHIP IS SHARED WITH NPEU, CODE "OWNS ONLY
              PART".
              IF NPEU OWNS ALL, CODE "Neither owns nor rents" OR
              "Pays rent".

                 1.  *Owns or is buying/land contract
                 2.  *Pays rent
                 3.  *Condo
                 4.  *Co-op
                 5.  *Townhouse Association
                 6.  *Retirement Lifetime Tenancy
                 8.  *OWNS ONLY PART
                -7.  *Neither owns nor rents
                 0.   Inap. (R lives in MH: X501=2; R lives on farm
                      and farm is operated as a business:
                      X501=4 or 5 and X503=1)
              ************************************************************
              CRITICAL VARIABLE: If the home ownership is answered
              "don't know" or "refuse," the following text appears in
              CAPI:*/

If x701 = 1 then homeowner=1; else homeowner=0;

**************************
Number of kids in household
**************************;
```

```
*variable from SCF is Kids - continuous variable number of kids in household without respect to
age.;
*Dependent children in household;
array one{1:9} x110 x116 x122 x128 x134 x204 x210 x216 x222;
array two{1:9} x108 x114 x120 x126 x132 x202 x208 x214 x220;
nkids=0;
do i=1 to 9;
if one{i}<18 and (4<=two{i}<=5 or 9<=two{i}<=29 or two{i}=36)
then nkids=nkids+1;
end;
if nkids>0 then children=1; else children=0;


**************************
Control Variables
**************************;
/*total net worth;
   NETWORTH=ASSET-DEBT;
   IF (NETWORTH<=.Z) THEN PUT Y1= &PID= FIN= NFIN= DEBT= LIQ= CDS=
NMMF=
     STOCKS= BOND= RETQLIQ= SAVBND= CASHLI= OTHMA= OTHFIN=
     VEHIC= HOUSES= ORESRE= NNRESRE= BUS= OTHNFIN=
     MRTHEL= RESDBT= OTHLOC= CCBAL= INSTALL= ODEBT=;*/

Networth = Networth;
if Networth > 0 then logNW=log(Networth);
else if Networth=0 then logNW=log(1);
else if Networth<0 then logNW=log(.01);

*Dummy variables for race of respondent;
  if race=1 then white=1; else white=0;          *white;
  if race=2 then black=1; else black=0;          *black;
  if race=3 then hispanic=1; else hispanic=0;     *hispanic;
  if race>3 then asianother=1; else asianother=0;  *asianother;

*education of respondent
X5931(#1)      What is the highest level of school completed or the highest
X6111(#2)      degree you have received?

            I'd like to ask you some questions about your (husband/wife/
            partner/spouse)'s background. What is the highest level of
            school or the highest degree (he/she/he or she) completed?

            RECORD THE HIGHEST LEVEL OF EDUCATION COMPLETED, NOT THE
            TIME IT TOOK TO COMPLETE IT.  DO NOT INCLUDE TRADE SCHOOLS
            AS COLLEGE.
```

```
1.   *1st, 2nd, 3rd, or 4th grade
2.   *5th or 6th grade
3.   *7th and 8th grade
4.   *9th grade
5.   *10th grade
6.   *11th grade
7.   *12th grade, no diploma
8.   *High school graduate - high school diploma or equivalent
9.   *Some college but no degree
10.   *Associate degree in college - occupation/vocation program
11.   *Associate degree in college - academic program
12.   *Bachelor's degree (for example: BA, AB, BS)
13.   *Master's degree ( for exmaple: MA, MS, MENG, MED, MSW, MBA)
14.   *Professional school degree (for example: MD, DDS, DVM, LLB, JD)
15.   *Doctorate degree (for example: PHD, EDD)
-1.   *Less than 1st grade
0.    Inap. (no spouse/partner)
*********************************************************
FOR THE PUBLIC DATA SET, CODE 15 IS COMBINED WITH
CODE 14;

if x8000=1 then respED=X6111; else respED=X5931;
        if respED<8 then respHSdrop=1; else respHSdrop=0;
        if respED=8 then respHS=1; else respHS=0;
        if respED in (9,10,11) then respSC=1; else respSC=0;
        if respED=12 then respBS=1; else respBS=0;
        if respED in(13,14,15) then respGRAD=1; else respGRAD=0;


PEU=x7001;
if PEU=1 then PEUSingle=1; else PEUSingle=0;
if PEU=2 then PEUTwo=1; else PEUTwo=0;
if PEU in (3:4) then PEU3or4=1; else PEU3or4=0;
if PEU in (5:6) then PEU5or6=1; else PEU5or6=0;
if PEU>=7 then PEU7ormore=1; else PEU7ormore=0;

Run;

proc freq data = data.scarcitysmall;
table NoScarcity AllScarcity LittleMoneyLotsTime LittleMoneyMedtime MedMoneyLotsTime
MedMoneyMedtime
MedMoneyLittleTime LotsMoneyMedTime LotsMoneyLittleTime;
where hhworking=1;
run;
```

```
proc freq data = data.scarcitysmall;
where income >=26328.55 and income<=214172.60 and hhworking=1;
table incomeq1 incomeq2 incomeq3 incomeq4 incomeq5;
run;

/*WT5 - WEIGHTED*/
proc means data = data.scarcitysmall median StD; weight wt5;
Var age income networth peu objfinknow subfinknow ;
where income >=26328.55 and income<=214172.60 and hhworking=1;
Run;

/*NWGT - UNWEIGHTED*/
proc means data = data.scarcitysmall median Std min max; weight nwgt;
Var age income networth peu objfinknow subfinknow;
where income >=26328.55 and income<=214172.60 and hhworking=1;
Run;

/*when running means, for income, use NWGT; you won't ever use wt5
When running freqs, to get % use NWGT
When running freqs, to get # use WT5*/
/*run for the Ns in descriptive table*/
proc freq data=data.scarcitysmall; weight wt5;
table homeowner white black hispanic asianother respHSdrop respHS respSC respBS respGRAD
singlemale
singlefemale married couple partner goodhealth fairhealth poorhealth IncAlwaysInsecure
IncCurrentInsecure;
where income >=26328.55 and income<=214172.60 and hhworking=1;
run;

/*run for the %s in descriptive table*/
proc freq data=data.scarcitysmall; weight nwgt;
table homeowner white black hispanic asianother respHSdrop respHS respSC respBS respGRAD
singlemale
singlefemale married couple partner goodhealth fairhealth poorhealth IncAlwaysInsecure
IncCurrentInsecure;
where income >=26328.55 and income<=214172.60 and hhworking=1;
run;

proc freq data=data.scarcitysmall; weight wt5;
table incomeq2 incomeq3 incomeq4 HHMain30 HHmain60 HHmain90 highborrow lowborrow
highsave lowsave;
where income >=26328.55 and income<=214172.60 and hhworking=1;
run;

/*run for the %s in descriptive table*/
proc freq data=data.scarcitysmall; weight nwgt;
```

```
table HHMainNoScar HHmainSomeScar HHmainInScar ;
where income >=26328.55 and income<=214172.60 and hhworking=1;
run;

proc freq data=data.scarcitysmall; weight wt5;
table HHMainNoScar HHmainSomeScar HHmainInScar ;
where income >=26328.55 and income<=214172.60 and hhworking=1;
run;

proc freq data=data.scarcitysmall; weight wt5;
table incomeq2 incomeq3 incomeq4 HHMain30 HHmain60 HHmain90 highborrow lowborrow
highsave lowsave;
where income >=26328.55 and income<=214172.60 and hhworking=1;
run;

/*run for the %s in descriptive table*/
proc freq data=data.scarcitysmall; weight nwgt;
table cantsave noreason basicneed ER retiresecure lovefam esteemlux selfAct;
where income >=26328.55 and income<=214172.60 and hhworking=1;
run;

proc freq data=data.scarcitysmall; weight nwgt;
table levratio;
where income >=26328.55 and income<=214172.60 and hhworking=1;
run;

proc means data = data.scarcitysmall median std; weight nwgt;
Var levratio;
where income >=26328.55 and income<=214172.60 and hhworking=1;
Run;

proc means data = data.scarcitysmall median; weight nwgt;
Var levratio;
Run;

proc means data = data.scarcitysmall mean median mode min p20 p40 p60
p80 max; weight wt5;
Var ObjFinKnow;
where (income = incomeq2 or incomeq3 or incomeq4) AND (hhworking=1);
Run;

proc freq data = data.scarcitysmall;
table NoScarcity AllScarcity LittleMoneyLotsTime LittleMoneyMedtime MedMoneyLotsTime
MedMoneyMedtime
MedMoneyLittleTime LotsMoneyMedTime LotsMoneyLittleTime;
where hhworking=1;
```

```
run;

proc freq data = data.scarcitysmall;
where income >=26328.55 and income<=214172.60 and hhworking=1;
table incomeq1 incomeq2 incomeq3 incomeq4 incomeq5;
run;

/*Lawson Code for RII*/

**********
Ordered Logit BASE MODEL Savings Motive
**********

*SORTS DATASET BY IMPLICATE;
PROC SORT DATA=data.scarcitysmall;
BY _Imputation_;
RUN;

*OBTAIN PARAMETER EST. FROM PROBIT FOR EACH IMPLICATE;
ods rtf file="SLE - Ordered Logit for Savings Motives RII";
PROC LOGISTIC DATA=data.scarcitysmall DESCENDING;
MODEL motive = /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
/*IncAlwaysInsecure
IncCurrentInsecure*/
/*TimeScar*/
/*HHMainNoScar HHmainSomeScar HHmainInScar*/
/*LowSave
LowBorrow*/
/*Other Ind. Vars.*/
SubFinKnow
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD
/rsq;
BY _imputation_; *runs spearate regressions by implicate;
ods output ParameterEstimates=SavMotvBase; *outputs parameter est;
TITLE 'WTD PARAMETER ESTS FOR ORDERED LOGIT SAVINGS MOTIVES - BASE
MODEL';
```

```
RUN;

*APPLY rii METHOD;
PROC MIANALYZE PARMS=SavMotvBase;
MODELEFFECTS INTERCEPT /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
/*IncAlwaysInsecure
IncCurrentInsecure*/
/*TimeScar*/
/*HHMainNoScar HHmainSomeScar HHmainInScar*/
/*LowSave
LowBorrow*/
/*Other Ind. Vars.*/
SubFinKnow
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD;
TITLE 'RII Odered Logit Savings Motives - BASE MODEL';
RUN;
ods rtf close;

****END of Models****;


**********
Odered Logit Savings Motive
**********

*SORTS DATASET BY IMPLICATE;
PROC SORT DATA=data.scarcitysmall;
BY _Imputation_;
RUN;

*OBTAIN PARAMETER EST. FROM PROBIT FOR EACH IMPLICATE;
ods rtf file="SLE - Ordered Logit for Savings Motives RII";
PROC LOGISTIC DATA=data.scarcitysmall DESCENDING;
MODEL motive = /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
IncAlwaysInsecure
```

```
IncCurrentInsecure
/*TimeScar*/
/*HHMainNoScar*/ HHmainSomeScar HHmainInScar
LowSave
LowBorrow
/*Other Ind. Vars.*/
SubFinKnow
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD;
BY _imputation_; *runs spearate regressions by implicate;
ods output ParameterEstimates=SavMotv; *outputs parameter est;
TITLE 'WTD PARAMETER ESTS FOR ORDERED LOGIT SAVINGS MOTIVES';
RUN;

*APPLY rii METHOD;
PROC MIANALYZE PARMS=SavMotv;
MODELEFFECTS INTERCEPT /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
IncAlwaysInsecure
IncCurrentInsecure
/*TimeScar*/
/*HHMainNoScar*/ HHmainSomeScar HHmainInScar
LowSave
LowBorrow
/*Other Ind. Vars.*/
SubFinKnow
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD;
TITLE 'RII Odered Logit Savings Motives';
RUN;
```

```
ods rtf close;

****END of Models****;


*****************
Binary Logit Basic Needs
*****************

*SORTS DATASET BY IMPLICATE;
PROC SORT DATA=data.scarcitysmall;
BY _Imputation_;
RUN;

*OBTAIN PARAMETER EST. FROM PROBIT FOR EACH IMPLICATE;
ods rtf file="SLE - BINARY Logit for Basic Needs RII";
PROC LOGISTIC DATA=data.scarcitysmall DESCENDING;
MODEL basicneed = /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
IncAlwaysInsecure
IncCurrentInsecure
/*TimeScar*/
/*HHMainNoScar*/ HHmainSomeScar HHmainInScar
LowSave
LowBorrow
/*Other Ind. Vars.*/
SubFinKnow
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD;
BY _imputation_; *runs spearate regressions by implicate;
ods output ParameterEstimates=BNeed; *outputs parameter est;
TITLE 'WTD PARAMETER ESTS FOR BasicNeeds';
RUN;

*APPLY rii METHOD;
PROC MIANALYZE PARMS=BNeed;
MODELEFFECTS INTERCEPT /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
```

```
IncAlwaysInsecure
IncCurrentInsecure
/*TimeScar*/
/*HHMainNoScar*/ HHmainSomeScar HHmainInScar
LowSave
LowBorrow
/*Other Ind. Vars.*/
SubFinKnow
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD;
TITLE 'RII Basic Needs';
RUN;
ods rtf close;

****END of Models****;

*****************
Binary Logit Retire Secure
*****************

*SORTS DATASET BY IMPLICATE;
PROC SORT DATA=data.scarcitysmall;
BY _Imputation_;
RUN;

*OBTAIN PARAMETER EST. FROM PROBIT FOR EACH IMPLICATE;
ods rtf file="SLE - BINARY Logit for RetireSecure RII";
PROC LOGISTIC DATA=data.scarcitysmall DESCENDING;
MODEL retiresecure = /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
IncAlwaysInsecure
IncCurrentInsecure
/*TimeScar*/
/*HHMainNoScar*/ HHmainSomeScar HHmainInScar
LowSave
LowBorrow
/*Other Ind. Vars.*/
SubFinKnow
```

```
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD;
BY _imputation_; *runs spearate regressions by implicate;
ods output ParameterEstimates=RetireS; *outputs parameter est;
TITLE 'WTD PARAMETER ESTS FOR Retire Secure';
RUN;

*APPLY rii METHOD;
PROC MIANALYZE PARMS=retires;
MODELEFFECTS INTERCEPT /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
IncAlwaysInsecure
IncCurrentInsecure
/*TimeScar*/
/*HHMainNoScar*/ HHmainSomeScar HHmainInScar
LowSave
LowBorrow
/*Other Ind. Vars.*/
SubFinKnow
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD;
TITLE 'RII Retire Secure';
RUN;
ods rtf close;

****END of Models****;

**********
Binary Logit EsteemLux
**********
```

```
*SORTS DATASET BY IMPLICATE;
PROC SORT DATA=data.scarcitysmall;
BY _Imputation_;
RUN;

*OBTAIN PARAMETER EST. FROM PROBIT FOR EACH IMPLICATE;
ods rtf file="SLE - BINARY Logit for EsteemLux RII";
PROC LOGISTIC DATA=data.scarcitysmall DESCENDING;
MODEL esteemlux = /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
IncAlwaysInsecure
IncCurrentInsecure
/*TimeScar*/
/*HHMainNoScar*/ HHmainSomeScar HHmainInScar
LowSave
LowBorrow
/*Other Ind. Vars.*/
SubFinKnow
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD;
BY _imputation_; *runs spearate regressions by implicate;
ods output ParameterEstimates=Esteem; *outputs parameter est;
TITLE 'WTD PARAMETER ESTS FOR Esteemlux';
RUN;

*APPLY rii METHOD;
PROC MIANALYZE PARMS=Esteem;
MODELEFFECTS INTERCEPT /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
IncAlwaysInsecure
IncCurrentInsecure
/*TimeScar*/
/*HHMainNoScar*/ HHmainSomeScar HHmainInScar
LowSave
LowBorrow
/*Other Ind. Vars.*/
SubFinKnow
```

```
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD;
TITLE 'RII EsteemLux';
RUN;
ods rtf close;

****END of Models****;

*****************
OLS REGRESSION FOR LEV RATIO
*****************;

ods rtf file="SLE - continuous OLS RII";
*obtain parameter est. from logti for each implicate;
PROC REG data=data.scarcitysmall;
model levratio = /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
IncAlwaysInsecure
IncCurrentInsecure
/*TimeScar*/
/*HHMainNoScar*/ HHmainSomeScar HHmainInScar
LowSave
LowBorrow
/*Other Ind. Vars.*/
SubFinKnow
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD / HCC VIF TOL;
by _imputation_;
ods output ParameterEstimates=levratioreg;
TITLE 'OLS on LevRatio with RII';
```

```
RUN;

*Apply RII Method;
proc mianalyze parms=levratioreg;
modeleffects intercept /*FinScar*/
Incomeq2 incomeq3 /*incomeq4*/
IncAlwaysInsecure
IncCurrentInsecure
/*TimeScar*/
/*HHMainNoScar*/ HHmainSomeScar HHmainInScar
LowSave
LowBorrow
/*Other Ind. Vars.*/
SubFinKnow
ObjFinKnow
resplessthan34 resp35to44 /*resp45to54*/ resp55to64 resp65orolder
/*goodhealth*/ fairhealth poorhealth
singlemale singlefemale /*married*/ partner
homeowner
PEUSingle /*PEUTwo*/ PEU3or4 PEU5or6 PEU7ormore
/*Control*/
logNW
/*white*/ black hispanic asianother
respHSdrop respHS /*respSC*/ respBS respGRAD;
Title 'RII Levratio Regression';
run;
ods rtf close;
```

Appendix B - Completed Table 2

Table 5: Full Cumulative Logit Analysis of Motives for Saving

	Base Model		Implicate 1		Implicate 2		Implicate 3		Implicate 4		Implicate 5		Significance Across Implicates
Variable (Reference Group)	Estimate	Odds Ratio	Estimate	Odds Ratio	Estimate	Odds Ratio	Estimate	Odds Ratio	Estimate	Odds Ratio	Estimate	Odds Ratio	
Intercept 8 - Can't Save	-4.8253		-5.0097		-5.0336		-5.0946		-5.0209		-5.0166		
Intercept 7 - No Reason	-2.9100		-3.0843		-3.1268		-3.1821		-3.0968		-3.1095		
Intercept 6 - Emergency	-1.5344		-1.6882		-1.7449		-1.8213		-1.7380		-1.7265		
Intercept 5 - Retire Secure	0.3628		0.2135		0.1542		0.0829		0.1632		0.1703		
Intercept 4 - Love and Family	3.1238		2.9558		2.9217		2.8624		2.9300		2.9407		
Intercept 3 - Esteem or Luxury	5.8492		5.7311		5.6712		5.6034		5.5618		5.6813		
Intercept 2 - Self-Actualization	5.9796		5.8649		5.8051		5.7372		5.6800		5.8152		
Log Net Worth	0.0075	1.008^	0.0077	1.0080	0.0096	1.0100	0.0061	1.0060	0.0073	1.0070	0.0083	1.0080	
Homeownership	0.1451	1.156***	0.1227	1.1310	0.1401	1.15^	0.1683	1.183*	0.1805	1.198*	0.1336	1.1430	
Financial Scarcity													
Objective (No Scarcity)													
Income Level 1 (Scarcity)	-0.0261	0.9740	-0.0265	0.9740	0.0355	1.0360	-0.0249	0.9750	-0.0084	0.9920	-0.0044	0.9960	
Income Level 2 (Some Scarcity)	-0.0665	0.936^	-0.0235	0.9770	-0.0470	0.9540	-0.0666	0.9360	-0.0703	0.9320	-0.0830	0.9200	
Subjective													
Always Insecure			0.0695	1.0720	0.0774	1.0800	0.1039	1.1090	0.1104	1.1170	0.1388	1.1490	
Insecure at the Moment			-0.0600	0.9420	-0.0488	0.9520	-0.0323	0.9680	-0.0371	0.9640	-0.0449	0.9560	
Time Scarcity													
Objective (No Scarcity)													
Work Hours Level 1 (Scarcity)			0.2381	1.269^	0.2046	1.2270	0.2928	1.34*	0.2479	1.281^	0.2321	1.261^	****
Work Hours Level 2 (Some Scarcity)			0.2468	1.28^	0.2039	1.2260	0.3034	1.354*	0.2398	1.271^	0.2479	1.281^	****
Subjective													
No Time for Borrowing Decisions			-0.0256	0.9750	-0.0082	0.9920	-0.0163	0.9840	-0.0184	0.9820	-0.0010	0.9990	
No Time for Savings Decisions			-0.0980	0.9070	-0.0833	0.9200	-0.0848	0.9190	-0.0831	0.9200	-0.0898	0.9140	
Financial Knowledge													
Objective	-0.0357	0.956^	-0.0379	0.9630	-0.0238	0.9770	-0.0373	0.9630	-0.0424	0.9580	-0.0301	0.9700	
Subjective	-0.0265	0.974**	-0.0340	0.967^	-0.0315	0.969^	-0.0241	0.9760	-0.0281	0.9720	-0.0284	0.9720	
Family Size (Two Members)													

Single	-0.0511	0.9500	-0.0947	0.9100	-0.0775	0.9250	-0.0397	0.9610	-0.0765	0.9260	-0.0169	0.9830	
3 or 4 members	0.3268	1.387***	0.3245	1.383**	0.3305	1.392**	0.3288	1.389**	0.3174	1.374**	0.3454	1.413***	*****
5 or 6 members	0.2975	1.347***	0.3098	1.363*	0.3321	1.394*	0.2916	1.339*	0.3295	1.39*	0.2926	1.34*	*****
7 or more members	0.6754	1.965***	0.6685	1.951*	0.6003	1.823^	0.7560	2.13*	0.7660	2.151*	0.5741	1.776^	*****
Perceived Health Status (Good)													
Fair	0.1130	1.12**	0.1089	1.1150	0.1233	1.1310	0.1067	1.1130	0.1035	1.1090	0.1046	1.1100	
Poor	-0.5991	0.549***	-0.5684	0.566*	-0.6110	0.543*	-0.5913	0.554*	-0.5910	0.554**	-0.6776	0.508**	*****
Marital Status (Married)													
Partner	0.0927	1.097^	0.1080	1.1140	0.0908	1.0950	0.0761	1.0790	0.0869	1.0910	0.0969	1.1020	
Single Male	0.0192	1.0190	0.0536	1.0550	0.0476	1.0490	0.0363	1.0370	0.0483	1.0490	-0.0009	0.9990	
Single Female	0.0020	1.0020	0.0427	1.0440	0.0366	1.0370	0.0252	1.0260	0.0281	1.0280	0.0020	1.0020	
Age (45-54)													
Less than 35	-0.2195	0.803***	-0.2090	0.811*	-0.2288	0.796*	-0.2091	0.811*	-0.2319	0.793*	-0.2449	0.783*	*****
34-44	0.0151	1.0150	0.0204	1.0210	0.0031	1.0030	0.0235	1.0240	0.0152	1.0150	0.0113	1.0110	
55-64	0.1192	1.127**	0.1500	1.1620	0.1373	1.1470	0.1542	1.1670	0.1282	1.1370	0.1221	1.1300	
65 or older	0.1136	1.12^	0.1982	1.2190	0.2356	1.2660	0.2079	1.2310	0.1736	1.1900	0.2075	1.2310	
Race (White)													
Black	-0.1164	0.89**	-0.1330	0.8780	-0.1316	0.8770	-0.1401	0.8690	-0.1241	0.8830	-0.1433	0.8670	
Hispanic	0.0759	1.0790	0.0633	1.0650	0.0871	1.0910	0.0561	1.0580	0.0736	1.0760	0.0390	1.0400	
Asian/Other	0.1053	1.1110	0.0652	1.0670	0.1033	1.1090	0.1018	1.1070	0.0806	1.0840	0.1154	1.1220	
Education (Some College)													
Dropped Out of HS	-0.0505	0.9510	-0.0255	0.9750	-0.1007	0.9040	-0.0748	0.9280	-0.0597	0.9440	-0.0261	0.9740	
HS	0.1913	1.211***	0.2281	1.256*	0.1859	1.204^	0.1776	1.194^	0.1801	1.197^	0.1806	1.198^	*****
Bachelor's	0.2021	1.224***	0.2128	1.237*	0.2324	1.262*	0.1823	1.2*	0.2043	1.227*	0.1742	1.19^	*****
Graduate	0.1657	1.18**	0.1867	1.205^	0.1783	1.195^	0.1651	1.1800	0.1917	1.211^	0.1542	1.1670	
N	15,133		3,034/15,133		3,032/15,133		3,034,15,133		3,021/15,133		3,022/15,133		
MODEL FIT STATISTICS													
Proportional Odds Assumption	<.0001		<.0001		<.0001		<.0001		<.0001		<.0001		
c Statistic	0.5680		0.5710		0.5720		0.5710		0.5730		0.5720		
AIC			8117.7530		8112.1180		8082.6690		8094.0770		8088.6520		
SC			8352.4410		8346.7800		8317.2280		8328.5980		8323.1850		
*-2 Log L			8039.7530		8034.1180		8004.6690		8016.0770		8010.6520		
R-Square	0.0238		0.0255		0.0260		0.0256		0.0271		0.0261		
Likelihood Ratio	<.0001		<.0001		<.0001		<.0001		<.0001		<.0001		

Source: Unweighted analysis of respondents in the 2016 Survey of Consumer Finances all five individual implicates. Note: ^p<.1, *p<.05, **p<.01, ***p<.0001 **** significant at .01 in 4 of 5 implicates, ***** significant at .01 in all implicates. Base model did not utilize RII.