

The influence of financial socialization on young adults

by

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B.B.A., Fort Hays State University, 2004

M.B.A., Fort Hays State University, 2012

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Personal Financial Planning  
College of Human Ecology

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

2018

## **Abstract**

College is a time when many young adults are beginning to make financial decisions on their own. The financial behaviors they engage in can have effects on their academic success, life satisfaction, relationship quality, physical and mental well-being, and financial well-being. This dissertation examined the direct and indirect relationships between financial socialization, financial knowledge, financial self-efficacy, and financial behaviors in college students using data from the 2014 National Student Financial Wellness Study (NSFWS). The sample consisted of 12,598 college students from 52 college institutions. Structural Equation Modeling (SEM) was conducted with the tested model guided by Gudmunson and Danes' (2014) Family Financial Socialization (FFS) conceptual framework.

Results revealed financial socialization has a direct influence on financial knowledge, financial self-efficacy, and financial behaviors. An indirect association between financial socialization and financial behaviors through its association with financial self-efficacy was also found. Alternative models discovered neither parental financial socialization nor formal financial education alone impacted financial knowledge, but when combined, their influence became significant, suggesting a possible interaction effect between formal financial education and parental financial socialization. Objective financial knowledge was not found to influence financial self-efficacy or financial behaviors in college students. Results showed financial self-efficacy to be the strongest predictor of students engaging in positive financial behaviors. A one standard deviation increase in financial self-efficacy was associated with a 90% increase in the standard deviation of financial behavior.

This study provides support and implications for the FFS conceptual framework.

Financial counselors, advisors, and therapists can use these findings to educate their clients on the importance of financial socialization of their children. Furthermore, results reinforce the need for mandatory formal financial education and infer the importance of parents and educators working together to cultivate financial knowledge in children.

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## Table of Contents

|   |     |
|---|-----|
| List of Figures .....                                     | x   |
| List of Tables .....                                      | xi  |
| Acknowledgements .....                                    | xii |
| Dedication .....  | xiv |
| Chapter 1 - Introduction .....                            | 1   |
| Research Questions .....                                  | 3   |
| Conceptual Framework .....                                | 4   |
| Hypotheses .....  | 7   |
| Chapter 2 - Review of Literature .....                    | 8   |
| Financial Socialization .....                             | 8   |
| Financial Socialization and Financial Knowledge .....     | 8   |
| Financial Socialization and Financial Self-Efficacy ..... | 11  |
| Financial Socialization and Financial Behavior .....      | 13  |
| Financial Knowledge .....                                 | 15  |
| Financial Knowledge and Financial Self-Efficacy .....     | 15  |
| Financial Knowledge and Financial Behavior .....          | 17  |
| Financial Self-Efficacy .....                             | 19  |
| Financial Self-Efficacy and Financial Behavior .....      | 19  |
| Summary .....   | 20  |
| Chapter 3 - Methods .....                                 | 23  |
| Data .....  | 23  |
| Missing Data .....  | 23  |
| Operationalization of Variables .....                     | 24  |
| Financial Socialization .....                             | 24  |
| Financial Knowledge .....                                 | 26  |
| Financial Self-Efficacy .....                             | 29  |
| Financial Behavior .....                                  | 29  |



|  |    |
|--|----|
| Demographics/Characteristics .....                       | 31 |
| Chapter 4 - Results.....                                 | 35 |
| Descriptive Statistics.....                              | 35 |
| Confirmatory Factor Analysis .....                       | 42 |
| Model Fit.....   | 45 |
| Structural Model Results.....                            | 45 |
| Direct Effects .....                                     | 48 |
| Indirect Effects.....                                    | 50 |
| Alternative Models.....                                  | 50 |
| Chapter 5 - Discussion .....                             | 53 |
| Financial Socialization.....                             | 53 |
| Demographics and Financial Socialization.....            | 53 |
| Financial Socialization and Financial Knowledge.....     | 55 |
| Financial Socialization and Financial Self-Efficacy..... | 56 |
| Financial Socialization and Financial Behavior .....     | 57 |
| Financial Knowledge .....                                | 58 |
| Financial Knowledge and Financial Self-Efficacy .....    | 58 |
| Financial Knowledge and Financial Behavior .....         | 59 |
| Financial Self-Efficacy .....                            | 59 |
| Financial Self-Efficacy and Financial Behavior .....     | 59 |
| Family Financial Socialization Conceptual Model.....     | 60 |
| Contributions .....                                      | 61 |
| Implications .....                                       | 62 |
| Strengths and Limitations .....                          | 65 |
| Future Research .....                                    | 66 |
| References.....  | 68 |
| Appendix A - Supplemental Tables and Figures .....       | 75 |
| Appendix B - SAS and Mplus Code.....                     | 86 |

## List of Figures

|   |    |
|---|----|
| Figure 1.1 Revised Family Financial Socialization Conceptual Model .....  | 4  |
| Figure 2.1 Revised Family Financial Socialization Conceptual Model .....  | 22 |
| Figure 4.1 Significant Pathways in Structural Model Predicting Financial Behavior ( $N =$<br>12,598)* .....                                     | 47 |
| Figure A.1 Significant Pathways in Structural Model Predicting Financial Behavior with Split<br>Socialization Construct ( $N = 12,598$ )* ..... | 84 |

## List of Tables

|   |    |
|---|----|
| Table 3.1 Items in Parcels .....  | 33 |
| Table 4.1 Summary Statistics .....  | 37 |
| Table 4.2 Confirmatory Factor Analysis Results for Latent Constructs without Parcels ( $N = 12,598$ ) ..... | 42 |
| Table 4.3 Confirmatory Factor Analysis Results for Latent Constructs with Parcels ( $N = 12,598$ ) .....    | 44 |
| Table 4.4 Direct Effects with Financial Behavior ( $N = 12,598$ ) .....                                     | 49 |
| Table A.1 Correlation Matrix for All Variables .....  | 75 |
| Table A.2 Split Socialization Model Direct Effects with Financial Behavior ( $N = 12,598$ )* .....          | 78 |
| Table A.3 Split Socialization Model Indirect Effects ( $N = 12,598$ )* .....                                | 79 |
| Table A.4 Direct Effects with Financial Behavior without First Year Students ( $N = 10,302$ )* ...          | 80 |
| Table A.5 Direct Effect with Financial Behavior for Do Not Know Income ( $N = 12,598$ )* .....              | 81 |
| Table A.6 Direct Effects with Financial Behavior for Prefer Not to Answer ( $N = 12,598$ )* .....           | 82 |
| Table A.7 Glossary .....  | 83 |

## Acknowledgements

They say “A journey of a thousand miles begins with a single step” and this degree has definitely felt like a thousand mile journey! And I could not have completed this part of my journey without the help of many kind souls. So I must thank God for putting these people in my life and for helping me achieve this dream. Thank you God, my Lord and Saviour!

Stu Heckman, thank you for your guidance on this dissertation and other research projects. Your unique perspective and vast knowledge has always had me in awe. Sonya Lutter and Kristy Archuleta, you both have been such an inspiration to me, personally and professionally. It has been an honor to learn from such talented researchers and to have you both as role models. Catherine Montalto, at The Ohio State University, thank you for being my “grand advisor” and allowing me to work with your data. I appreciate the suggestions and resources you provided. Christy Craft, thank you for being a part of my committee. I enjoyed getting to know more about your research and appreciate your thoughtful feedback. Tierra Dimond, thank you for being a great advisor and making things seem less daunting. Martin Seay and Morey MacDonald, you both have provided me with wonderful words of wisdom along the way, and I’m grateful you are a part of my journey. I have learned so much from all of the faculty at Kansas State and for that I am eternally grateful.

To my crazy cohort members: Kate (the craziest of them all), David, Julie, Ben, Vincent, and Dennis, thank you for your friendship and support over these past four years. United we stand (and eventually graduate)! Derek Lawson, you have been such a great friend and peer in this experience. I don’t know what I would have done without your guidance on SEM! Sarah Asebedo, thank you for cheering me on and hooking me up with Stats Camp to learn SEM. You too have been an inspiration to me and I thank you.

To Dawn and Phil Anderson at the Anderson Bed and Breakfast, I could not have survived my summers at “boot camp” without the comforts of home you provided. You have become my Manhattan family and home away from home. If only those chocolate chip cookies didn’t stick to my waistline!

I must also thank my friends and colleagues at Fort Hays State University (especially Nanette Fitzhugh, Rachel Dolecheck, and Linda Kepka) for listening to me rejoice and complain and encouraging me along the way. I also can’t forget to thank the professor whose stories and teaching planted the seed that made me want to get my doctorate, Micol Maughan. Micol, I love you!

And last, but certainly not least, thank you Mom and Bob! Without you guys, this wouldn’t be possible.

## **Dedication**

To quote my favorite president, Abraham Lincoln, “All that I am, or hope to be, I owe to my angel mother.” For that reason, this dissertation is dedicated to my amazing mother, Elaine, whose mental, spiritual, and financial support over the years has allowed me to pursue my dreams. Thank you, Mom, for all you have done for me. My love for you is unmeasurable.

## **Chapter 1 - Introduction**

College is a time when many young adults are leaving home for the first time, meeting new people, and trying to establish the delicate balance of school, friends, work, and finances. As college students make their way into the adult world, they find themselves facing new financial challenges – paying rent and bills, managing student loan debt, applying for credit cards, and establishing financial behaviors that they may continue as they grow older. The financial behaviors these college students engage in can profoundly impact their well-being. Positive financial behaviors have been linked to higher GPA, greater academic satisfaction, and greater life satisfaction (Xiao, Tang, & Shim, 2009). Financial behavior is fundamental to financial well-being (Brüggen, Hogreve, Holmlund, Kabadayi, & Löfgren, 2017; Gutter & Copur, 2011), with financial well-being in turn being positively associated with psychological and physical health (Shim, Xiao, Barber, & Lyons, 2010), relationship quality (Dew & Xiao, 2013), and overall life satisfaction (Netemeyer, Warmeth, Fernandes, & Lynch, 2018). Engaging in positive financial behaviors is associated with lower financial stress, higher subjective well-being, and lower psychological distress (Serido, Shim, Mishra, & Tang, 2010).

With financial behavior having such a strong influence on many areas of well-being, teaching children to manage their finances should be a major priority for parents. Yet nearly 52% of parents reported reluctance to discuss financial matters with their children, and only 33% of parents reported discussing financial topics with their kids once a week or more (T. Rowe Price, 2016). Parents may be unsure how to teach their children to engage in positive financial behaviors or which financial socialization practices are effective. Family financial socialization is the process by which children acquire and develop financial knowledge, skills, attitudes, and behaviors over time (Gudmunson & Danes, 2011). Parents are often considered the primary

socialization agent for their children. Financial socialization can result from conversations parents have with their children about money, children observing their parents' financial behaviors, formal education at school, working at a job, and through direct experience with money. Financial socialization is thought to influence financial self-efficacy, financial knowledge, and financial behaviors.

The concept of self-efficacy is perfectly embodied by Henry Ford's famous quote, "Whether you think you can or you cannot, you are right". First postulated by Albert Bandura (1977) as a construct to mediate behavior change, self-efficacy represents one's confidence in their ability to produce a desired result. The greater one's self-efficacy, the more likely they will attempt a behavior, as well as persist in the face of difficulties (Bandura, 1977). Financial self-efficacy is domain specific, reflecting confidence in one's ability to manage their personal finances. Studies have found individuals with higher levels of financial self-efficacy experience lower levels of financial stress (Lapp, 2010), improved financial behavior, and greater financial well-being (Serido, Shim, & Tang, 2013). Furthermore, the influence of self-efficacy appears to be enduring. In a longitudinal study conducted over nine years, higher levels of economic self-efficacy in high school students was associated with increased odds of completing college by age 24, higher income in young adulthood, and early adult financial independence (Lee & Mortimer, 2009). Despite the positive influences of having greater financial self-efficacy, limited research has been conducted to determine the antecedents of financial self-efficacy. This study seeks to add to the literature by examining the direct and indirect effects of financial socialization on financial self-efficacy, financial knowledge, and financial behaviors. (For those not familiar with these terms, definitions can be found in the Appendix, Table A.7.)



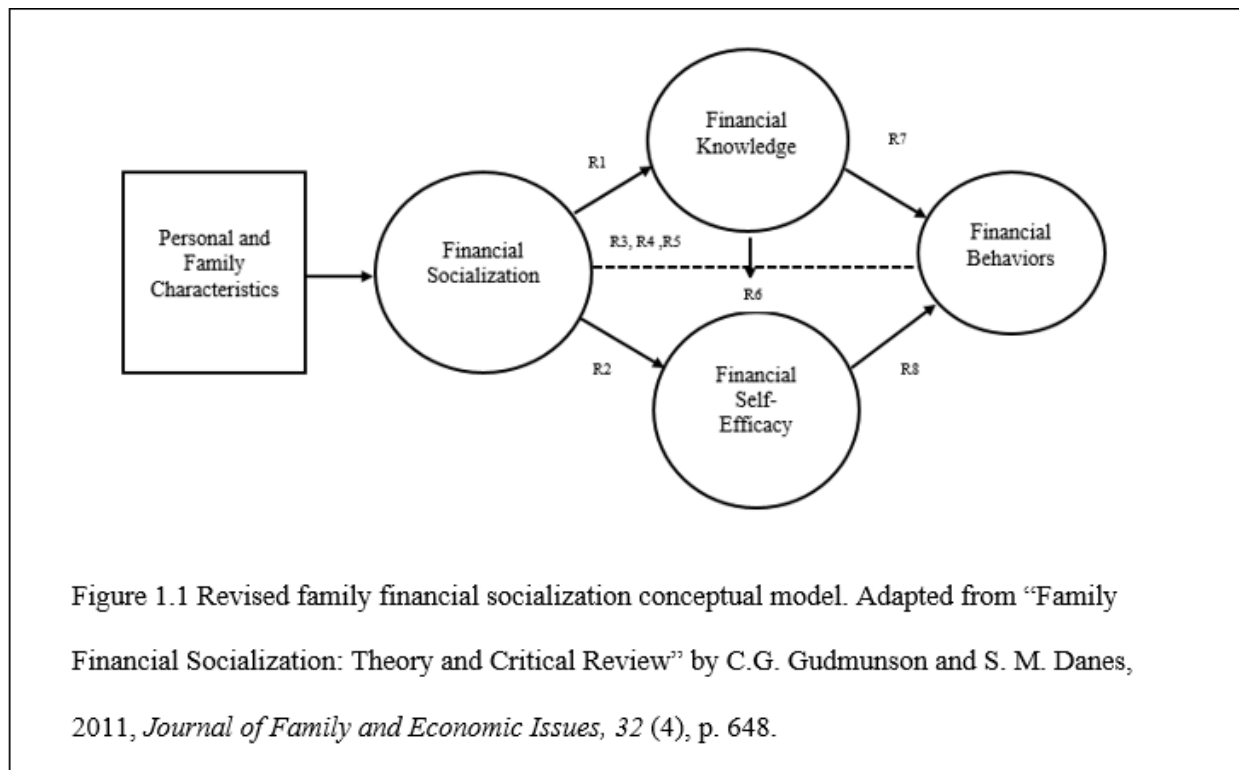
The current study tests the family financial socialization model developed by Gudmunson and Danes (2011), which suggests implicit and explicit socialization directly influence financial attitudes, knowledge, and capabilities. Self-efficacy is considered a motivating factor of capabilities (Gudmunson & Danes). Financial behaviors are thought to be directly influenced by financial self-efficacy and indirectly affected by financial socialization. Structural equation modeling was used to examine the association between financial socialization, financial self-efficacy, financial knowledge, and financial behaviors in college students using data from the 2014 National Student Financial Wellness Survey.

### **Research Questions**

Following the paths for the revised financial socialization conceptual model shown in Figure 1.1, this study sought to answer the following research questions:

- R1: What is the relationship between financial socialization and objective financial knowledge?
- R2: What is the relationship between financial socialization and financial self-efficacy?
- R3: What is the relationship between financial socialization and financial behaviors?
- R4: Is there an indirect relationship between financial socialization and financial behaviors through financial self-efficacy?
- R5: Is there an indirect relationship between financial socialization and financial behaviors through financial knowledge?
- R6: What is the relationship between financial knowledge and financial self-efficacy?
- R7: What is the relationship between financial knowledge and financial behaviors?
- R8: What is the relationship between financial self-efficacy and financial behaviors?

**Figure 1.1 Revised Family Financial Socialization Conceptual Model**



## Conceptual Framework

Financial literacy research conducted over the last 40 years has used a variety of theoretical frameworks, such as behavioral life cycle, consumer socialization, resource management, and systems theories to explore the variables related to financial behaviors (Gudmunson & Danes, 2011). These studies have primarily focused on the individual as the unit of analysis, without consideration of how family has influenced the individual through socialization (Gudmunson & Danes). Through their examination of over 100 research articles, Gudmunson and Danes created the family financial socialization (FFS) conceptual model to outline the relationship between family socialization processes and the financial socialization outcomes of financial attitudes, knowledge, capabilities, behavior, and well-being. The current study utilizes the FFS conceptual model to examine if explicit and implicit socialization

processes influence financial self-efficacy in college students, as self-efficacy is considered to be a motivation source for a person to attempt what they are capable of doing (Danes & Yang, 2014), and also for behavior change (Bandura, 1977). Further analysis was conducted to explore the associations between financial socialization, financial self-efficacy, financial knowledge, and financial behaviors in college students.

The FFS model proposes using the demographic variables of gender, age, and race, and family characteristics, such as family size and socioeconomic status, as predictors of financial outcomes through their association with family socialization processes. Since the exact nature of these relationships is unknown (Danes & Yang, 2014; Gudmunson & Danes, 2011) and not the focus of the present study, demographics were treated as control variables for the purpose of this paper.

Family interactions and relationships are representative of family dynamics and implicit socialization processes. Families interact as a system, with individual behaviors influencing and eliciting feedback from others in the family system. Communication and relationship quality impact how implicit and explicit messages are received. Implicit financial socialization occurs from children observing parent financial behaviors and daily interactions. Explicit financial socialization involves purposive efforts to teach, model, and practice financial knowledge and behaviors. Purposive financial socialization can occur bi-directionally, and within any family relationship, not just from parent to child (Danes & Yang, 2014)

Family interactions and relationships are evaluated separately from purposive financial socialization in Gudmunson and Danes (2011) model, in order to gain a greater understanding of how these constructs influence attitudes, knowledge, and capabilities. Capabilities define what an individual is able to do, rather than what is done proficiently, and also includes internal sources

of motivation such as self-efficacy, values, perceived needs, and living standards. Self-efficacy may explain variations in what individuals of similar circumstances are capable of achieving. Through its interaction with knowledge, self-efficacy may help produce behavior change (Gudmunson & Danes, 2011).

In the FFS model, financial attitudes, knowledge, and capabilities influence financial behavior and financial well-being. The financial behavior construct consists of two types of financial behaviors. The first type of financial behaviors represents patterns of action over time. The second type of behaviors is related to decision making and financial turning points, such as setting up a retirement account, or establishing automatic savings from one's paycheck. The relationship between financial attitudes, knowledge, and capabilities and financial behaviors and well-being requires further research to determine if the influences are enhancing or constraining. Financial behaviors directly impact financial well-being. Financial well-being consists of objective measures, such as income, savings, net worth, asset accumulation, and financial ratios, as well as subjective measures, such as financial satisfaction (Danes & Yang, 2014). Because most college students have not yet had time to acquire many assets, and many are acquiring student loans, any objective evaluation of financial well-being in college students would be futile, and therefore, is not included in this study. Instead the focus is on the financial behaviors of college students, with the presumption that they may continue their financial behaviors into adulthood.

The present study examines the influence of implicit and explicit socialization agents, such as direct teaching about money, parents as financial role models, and formal education on financial self-efficacy, financial knowledge, and financial behaviors in college students. As self-efficacy is considered a motivation source of capabilities, it is hypothesized the financial

socialization processes will be positively associated with financial self-efficacy. As parents and educators socialize children on positive financial norms, confidence in one's ability to manage their finances should increase. It is posited higher financial self-efficacy will result in performance of a greater number of positive financial behaviors. By using the FFS conceptual model, the present study provides an opportunity to test an emerging theory specifically developed for the personal finance field.

## **Hypotheses**

Based on the Family Financial Socialization conceptual model, the following hypotheses will be tested:

- H1: Financial socialization will be associated with objective financial knowledge.
- H2: Financial socialization will be associated with financial self-efficacy.
- H3: Financial socialization will have a positive and direct relationship with financial behaviors.
- H4: Financial socialization will have an indirect relationship with financial behavior through financial self-efficacy.
- H5: Financial socialization will have an indirect relationship with financial behavior through financial knowledge.
- H6: Financial knowledge will be positively associated with financial self-efficacy.
- H7: Financial knowledge will be positively associated with financial behaviors.
- H8: Financial self-efficacy will be positively associated with financial behaviors.

## **Chapter 2 - Review of Literature**

An indirect link between financial socialization and financial self-efficacy has been demonstrated through its association with financial knowledge—financial socialization has been shown to influence financial knowledge (Grohmann, Kouwenberg, & Menkoff, 2015; Shim, Barber, Card, Xiao, & Serido, 2009; Shim et al., 2009) and others have shown that financial knowledge influences financial self-efficacy (Danes, Huddleston-Casas, & Boyce, 1999; Lapp, 2010; Sanders, Weaver, & Schnabel, 2007; Serido et al., 2013). Both financial knowledge and self-efficacy have a positive relationship with financial behaviors (Bandura, 1977; Babiarz & Robb, 2013; Henager & Cude, 2016; Lown, Kim, Gutter, & Hunt, 2015; Montford & Goldsmith, 2016). Socialization tends to influence financial behaviors, though results vary when examining specific socialization activities (Jorgensen, Rappleyea, Schweichler, Fang, & Moran, 2017; Kim & Chatterjee, 2013; Kim, LaTaillade, & Kim, 2011; Serido et al., 2010). The following literature review provides support for the need for further study on the influence of financial socialization on self-efficacy, financial knowledge, and financial behaviors.

### **Financial Socialization**

#### **Financial Socialization and Financial Knowledge**

Parents are commonly considered the primary socialization agents for their children (Gudmunson & Danes, 2011). With regard to finances, parents socialize their children by modeling consumer behaviors, establishing the rules and norms for their children's financial behaviors, and directly discussing financial related topics with their children (Allen, 2010). By encouraging their children to open a bank account, save, and/or invest money, parents are providing direct teaching of their financial attitudes and beliefs. Parents sometimes pay their

children an allowance as a way for the child to learn how to manage their own money (Hira, 1997). Financial socialization can also occur through formal financial education, such as a class or workshop in high school and/or college, as well as experience gained from working and earning money. According to the FFS model, purposive financial socialization can either promote or inhibit financial knowledge, attitudes, and capabilities (Danes & Yang, 2014).

In a survey of freshmen college students, researchers examined the influence of direct parental financial teaching, parental financial behavior, high school financial education, and high school work experience on financial knowledge (Shim et al., 2010). Financial knowledge was modeled as a common latent construct, using both objective and subjective measures of knowledge. A single item question asked students to rate their overall understanding of money management concepts to determine their subjective financial knowledge. Fifteen true/false questions provided the measurement for objective financial knowledge. Results of the study found direct parental teaching, high school financial education, and high school work experience had a significant direct effect on financial knowledge (Shim et al., 2010).

Previous research conducted by Shim et al. (2009) surveyed a random sample of undergraduate and graduate college students and found parental socialization (measured by asking respondents if their parents/guardians included them in discussions on saving, family spending, their own spending, and use of credit) and formal financial education were significantly related to perceived financial knowledge. In this study, gender was also included as a possible influence on perceived financial knowledge. Compared to male students, female students were significantly less likely to perceive themselves as financial knowledgeable (Shim et al.). Research has suggested there may be differences in financial socialization between genders. Garrison and Gutter (2010) found significant differences in social learning opportunities

between males and females in regards to finances. Females were found to have more opportunities to discuss financial matters with their parents and with their peers, and had more opportunities to observe their parents and their peers engage in positive financial behaviors (Garrison & Gutter, 2010). Formal financial education, however, may be more beneficial for females, as suggested by Danes and Haberman (2007) who found when high school students received formal financial education, the female students had a greater increase in financial knowledge than the male students. Danes and Haberman attributed this difference to the possibility that female and male students may experience differences in context and degree of socialization within the family. As illustrated in Figure 1.1, the FFS model suggests demographic variables such as gender, age, race, and family income influence socialization processes, which in turn influence financial outcomes.

Other studies have found differences in how explicit and implicit socialization practices influence financial knowledge (Grohmann et al., 2015; Jorgensen & Savla, 2010). In a study of middle-class Thai households, researchers found financial socialization by parents through instruction on budgeting and saving had a positive relationship to financial literacy, while socialization through work experience and early money experience had a negative influence on financial literacy (Grohmann et al., 2015). Jorgensen and Savla (2010) found that perceived parental influence had a negative association with objective financial knowledge in college students; however these results were not significant. Using different measurements for socialization may provide different results. The current study examines parental financial socialization and formal financial education to determine if there is a relationship between financial socialization and objective financial knowledge.



## **Financial Socialization and Financial Self-Efficacy**

Financial self-efficacy represents one's confidence in their ability to manage their personal finances. Using path analysis, Heckman and Grable (2011) examined the direct relationship of parental debt attitudes, student income, and dependency status on financial knowledge, and explored the indirect effect of these variables on financial self-efficacy. Data was collected from a small sample ( $N = 80$ ) of university students via online and paper survey. Perceived parental debt attitudes were measured using nine survey items, the sum of which indicated either positive attitudes (higher scores) or negative attitudes (lower scores) toward debt. Self-reported percentage of monthly expenses paid for by parents/guardians indicated financial dependency. Lower percentages reflected greater financial independence. Financial self-efficacy was measured using a single item question asking how strongly the participant agreed or disagreed with the statement, "I feel confident about making decisions that deal with money." A 20-item personal finance quiz measured objective financial knowledge, with the number of correct items summed, and higher scores reflective of greater financial knowledge. Results of the study showed students with higher levels of income had greater financial knowledge and higher financial self-efficacy. Students who relied on their parents financially showed lower levels of financial knowledge and lower self-efficacy; however, these results were not significant. A significant positive relationship was found between students with higher financial knowledge and financial self-efficacy. This lends support for further examination of the relationship between objective financial knowledge and financial self-efficacy. An indirect path from financial socialization to financial self-efficacy showed a weak yet insignificant association between the two. The weakness of the association could be due to the small sample size (Heckman & Grable, 2011).

Studies examining the direct link between financial socialization and financial self-efficacy have found mixed results. One study followed high school students from their freshmen year until six years after their scheduled graduation from high school to determine if family socialization influenced economic self-efficacy (Lee & Mortimer, 2009). Economic self-efficacy was measured during their senior year of high school by asking respondents to respond to three questions about how they viewed the future. Questions asked “what are the chances that you will have a job that pays well?,” “what are the chances you will have a job that you enjoy doing?,” and “what are the chances you will be able to own your own home?” Economic self-efficacy was similar between boys and girls, yet girls were more optimistic about having a job they enjoy doing in the future. A baseline model examined the influence of family background and academic performance on self-efficacy. Family income and grades were found to have a significant positive influence on economic self-efficacy in high school. Parents’ education level also had an influence on the child’s economic self-efficacy. A second model tested the influence of socialization on self-efficacy. Children whose parents talked with them about their work had greater economic self-efficacy; however, receiving an allowance resulted in lower levels of self-efficacy. A third model tested the combined effects of family background and socialization on economic self-efficacy. Only parent-child discussions related to work and receiving an allowance were shown to significantly influence economic self-efficacy in the third model, suggesting background differences and academic performance cannot fully explain differences in self-efficacy (Lee & Mortimer, 2009).

The direct link between financial socialization and financial self-efficacy was also examined in a longitudinal study of college students, conducted during their first and fourth year of college (Shim, Serido, Tang, & Card, 2015). Perceived parental financial role modeling,

perceived parental communication about finances, perceived parental financial expectations, perceived friends' financial behaviors, formal classroom learning, and informal self-learning were analyzed to determine if changes in the socialization agents influenced change in financial self-efficacy. Only changes in parental communication and changes in formal classroom learning significantly influenced change in financial self-efficacy (Shim et al., 2015). The results of Shim and associates' study are based on changes in socialization agents. It does not address socialization from a previous point in time. If parents did not change their socialization behaviors during the four years their child was in college, then it is unlikely it would produce a change in financial self-efficacy. The present research analyzes socialization practices from a prior point in time to determine if the practices themselves influence self-efficacy.

### **Financial Socialization and Financial Behavior**

Several studies have examined the relationship between socialization and financial behavior. Financial communication between parents and children has been shown to have a positive association with budgeting and cash management, credit management, saving and investment behavior, and long-term planning (Jorgensen et al., 2017). Similar results were found by Serido et al. (2010) in a study examining financial parenting, coping behaviors, and financial well-being of college students. Perceived parental financial communication (based on perception of communication quality) and perceived parental financial expectations were found to be positively related to preventative financial coping behaviors (tracking expenses, following a budget) and proactive financial coping behaviors (saving money and investing in long-term financial goals; Serido et al.). A study of adults, ages 24-66 with low-and moderate-income, also found evidence supporting financial communication's influence on financial behaviors (Cho, Gutter, Kim, & Mauldin, 2012). Respondents whose parents discussed the importance of saving,

using credit, and having a spending plan were more likely to report having a spending plan and written financial goals than respondents whose parents did not have financial discussions with them (Cho et al.).

Parental financial behavior has been linked to children's financial behavior (Cho et al., 2012; Webley & Nyhus, 2006). Adult children who categorized their parents as savers were more likely to engage in financial planning behaviors than those whose parents were not categorized as savers (Cho et al., 2012). Categorizing one's parents as savers or non-savers suggested a level of implicit or explicit socialization, either through perceived financial behavior or direct financial conversations about saving from the parent. In a Dutch study examining parental influence on children's saving behavior, the amount of money saved by parents was found to be positively related to the amount of money children (ages 16-21) saved (Webley & Nyhus, 2006).

Webley and Nyhus (2006) also found that financial socialization through means of financial communication, earning money as a teenager, and being encouraged to have a bank account was found to be associated with children having a preference for saving left-over money rather than spending it. Some socialization processes may be more effective than others at influencing financial behavior. A study using a nationally representative sample examined financial socialization and young adult (ages 18-21) financial management found that children who had a savings account as a child, whose parents monitored their spending, and those who worked for pay were more likely to have bonds, CD's, or other non-bank account related liquid assets (Kim & Chatterjee, 2013). Receiving an allowance has been shown to have mixed results (Kim & Chatterjee; Kim et al., 2011). In a study examining adolescents' financial behaviors, receiving an allowance was not related to having a savings account, nor was it related to saving

for future schooling among those who had savings accounts (Kim et al.). Adult children ages 18 to 21 who reported receiving an allowance were more likely to carry a credit card balance; however, they were also less likely to report financial anxiety and to be fully responsible for managing their finances (Kim & Chatterjee).

In a meta-analysis of 126 studies, Kaiser and Menkhoff (2017) found financial education interventions to have a significant, positive influence on financial knowledge and financial behaviors. Specifically, they found financial education to have significant influence on budgeting, saving, and retirement saving; however, there was not a significant difference in borrowing and debt management, insurance and risk mitigation, or bank account behavior. The analysis also examined how the setting/type of financial education (classroom versus non-classroom, online, counseling, and informational nudge) influenced knowledge and behavior. While classroom learning significantly increased financial knowledge, there were no significant differences in financial behavior by education setting/type. Furthermore, the meta-analysis found financial knowledge to be a significant predictor of financial behaviors.

## **Financial Knowledge**

### **Financial Knowledge and Financial Self-Efficacy**

Research examining the antecedents of financial self-efficacy have primarily focused on the influence of financial knowledge. In a study conducted by Serido et al. (2013), college students were surveyed during their first and fourth year of college to determine if changes in objective and subjective financial knowledge influenced changes in financial self-efficacy. Subjective financial knowledge was measured using a single-item question asking the respondent to rate their overall level of understanding of personal finance concepts and practices. Objective financial knowledge was measured using a 15-item true/false quiz on financial topics. Students

showed significant increases in objective and subjective financial knowledge, as well as financial self-efficacy between their first and fourth year of college. Change in subjective knowledge was found to be significantly related to change in financial self-efficacy; however, change in objective financial knowledge did not influence change in self-efficacy. This suggests that what individuals think they know is more influential on self-efficacy than what they actually know (Serido et al., 2013). Results for objective financial knowledge could potentially differ, depending on variable measurement. True/false responses provide for a 50% chance of the respondent guessing the correct answer, when actually they may not know the answer.

Other studies have examined the influence of financial education on financial knowledge and financial self-efficacy. Participants of a financial training program were surveyed on their subjective financial knowledge and financial self-efficacy both before they participated in the training and one year later (Lapp, 2010). Results showed subjective financial knowledge significantly increased one year after the training. While the study did not indicate if there was a significant increase in financial self-efficacy, changes in subjective financial knowledge were found to be significantly related to changes in financial self-efficacy (Lapp, 2010). Similar results were found in a study of high-school students (Danes et al., 1999). Financial education was found to significantly increase both subjective financial knowledge and financial self-efficacy, although the relationship between financial knowledge and financial self-efficacy was not explored (Danes et al., 1999).

The review of the literature highlights the important difference between objective and subjective financial knowledge. Objective financial knowledge represents what one actually knows about personal finance, while subjective financial knowledge represents what one thinks they know about personal finance. Results of these studies suggest instilling financial self-

efficacy might not be a result of actual knowledge, but rather a result of encouragement and experience, something socialization can provide. The present study examines the relationship between objective financial knowledge and financial self-efficacy by measuring objective financial knowledge using four multiple choice questions in order to explore if a different variable measurement yields different results.

### **Financial Knowledge and Financial Behavior**

A relationship between financial knowledge and financial behaviors has been identified in many studies. Both objective and subjective financial knowledge has been found to be positively associated with having an emergency fund, planning for retirement (Angrisani, Kapteyen, & Lusardi, 2016; Chatterjee, Fan, Jacobs, & Haas, 2017; de Bassa Scheresberg, 2013), spending less than income, paying credit cards in full (Angrisani et al.); having investments, and not overdrawing one's checking account (Henager & Cude, 2016). Objective financial knowledge has also been found to be negatively associated with high cost borrowing (de Bassa Scheresberg). In a study examining financial knowledge and best financial practices, Robb and Woodyard (2011) found a significant correlation between both objective and subjective financial knowledge and positive financial behaviors. Positive financial behavior was measured using a scale that summed the number of best practice financial activities performed out of six possible activities: having an emergency fund to cover 3 months of expenses, checking one's credit report in the past 12 months, not overdrawing one's checking account, having a retirement account, and having insurance. The study did not examine the activities on an individual basis (Robb & Woodyard).

A two-time period longitudinal study conducted by Serido et al. (2013) investigated the association between change in financial knowledge over time and change in financial behaviors

through a survey of college students. Students were surveyed during their first year of college and again during their fourth year of college. Objective financial knowledge was measured using a 15-item true/false quiz. While a change in objective financial knowledge did not have a significant association with a change in financial behaviors, a significant positive relationship between change in subjective knowledge and change in financial behaviors did exist. Financial behaviors consisted of a scale of six items, including tracking monthly expenses, spending with their budget, paying credit cards in full each month, saving money each month, and investing for long-term financial goals. Change in specific behaviors were not examined in the study (Serido et al.).

Objective financial knowledge has also been found to decrease negative financial behaviors (Nghia & Scott, 2018; Xiao, Chen, & Chen, 2014). While examining the influence of financial knowledge and behavior on financial distress, Nghia and Scott (2018) found higher levels of financial knowledge lowered the likelihood of not saving enough for retirement, and reduced the probability of making late mortgage payments. Similarly, Xiao, Chen, and Chen (2014) found a strong negative correlation between objective financial knowledge and negative financial behaviors, indicating the higher a person's financial knowledge, the less likely they were to engage in negative behaviors, such as spending more than income, carrying a credit card balance, making late credit card or mortgage payments, and taking a 401(k) loan. Xiao and associates also found objective financial knowledge to be positively correlated with positive financial behaviors, such as having an emergency fund, calculating retirement needs, requesting a credit report, and comparing loan offers for autos, mortgages, and/or credit cards. In both studies, objective financial knowledge was measured using 5 multiple-choice questions examining knowledge on interest rates, inflation, bond prices, mortgage payments, and stocks.



The present study explores the relationship between objective financial knowledge and financial behaviors, including following a budget, tracking spending, paying bills on time, and saving regularly.

## **Financial Self-Efficacy**

### **Financial Self-Efficacy and Financial Behavior**

The relationship between self-efficacy and behavior has been examined from two points of view. As posited by Albert Bandura (1977), efficacy expectations – whether one believes they can successfully perform a behavior – determines the amount of effort and persistence an individual will expend to achieve behavior success. Efficacy expectations are influenced by previous successful attempts at the behavior, seeing others succeed at the behavior, verbal persuasion, and emotional arousal (Bandura, 1977). Socialization experiences, such as parental encouragement to open a bank account, save and invest money, as well as opportunities to practice money management with income received either from working or as an allowance, may increase self-efficacy and lead to performance of positive financial behaviors in young adulthood. Likewise, the successful completion of positive financial behaviors, such as budgeting, tracking expenses, paying bills on time, and regularly saving could boost financial self-efficacy. This suggests a bi-directional relationship between self-efficacy and behavior. Many studies have examined the relationship from self-efficacy to behavior (Asebedo et al., 2018; Asebedo & Browning, 2017 ; Farrell, Fry, & Risse, 2016; Lapp, 2010; Lown et al., 2015; Montford & Goldsmith, 2016). Montford and Goldsmith found that higher financial self-efficacy was associated with willingness to make riskier investment decisions. Women with higher levels of financial self-efficacy were more likely to hold a mortgage, a savings account, or investments, and less likely to hold debt in the form of a credit card or loan (Farrell et al.). Self-efficacy has

also been shown to have a positive relationship with saving (Asebedo et al.; Lapp; Lown et al.), lower levels of debt, fewer financial problems (Lapp), and lower portfolio withdrawal rates (Asebedo & Browning). Gutter, Copur, and Garrison (2009) found that students who used a budget to avoid overspending, checked their credit report in the last year, and regularly saved had higher levels of financial self-efficacy than student who did not perform these behaviors. The FFS model takes the position that socialization influences financial attitudes and capabilities such as financial self-efficacy, which in turn influences financial behaviors. This study explores the indirect effect of financial self-efficacy on the relationship between financial socialization and financial behaviors in college students.

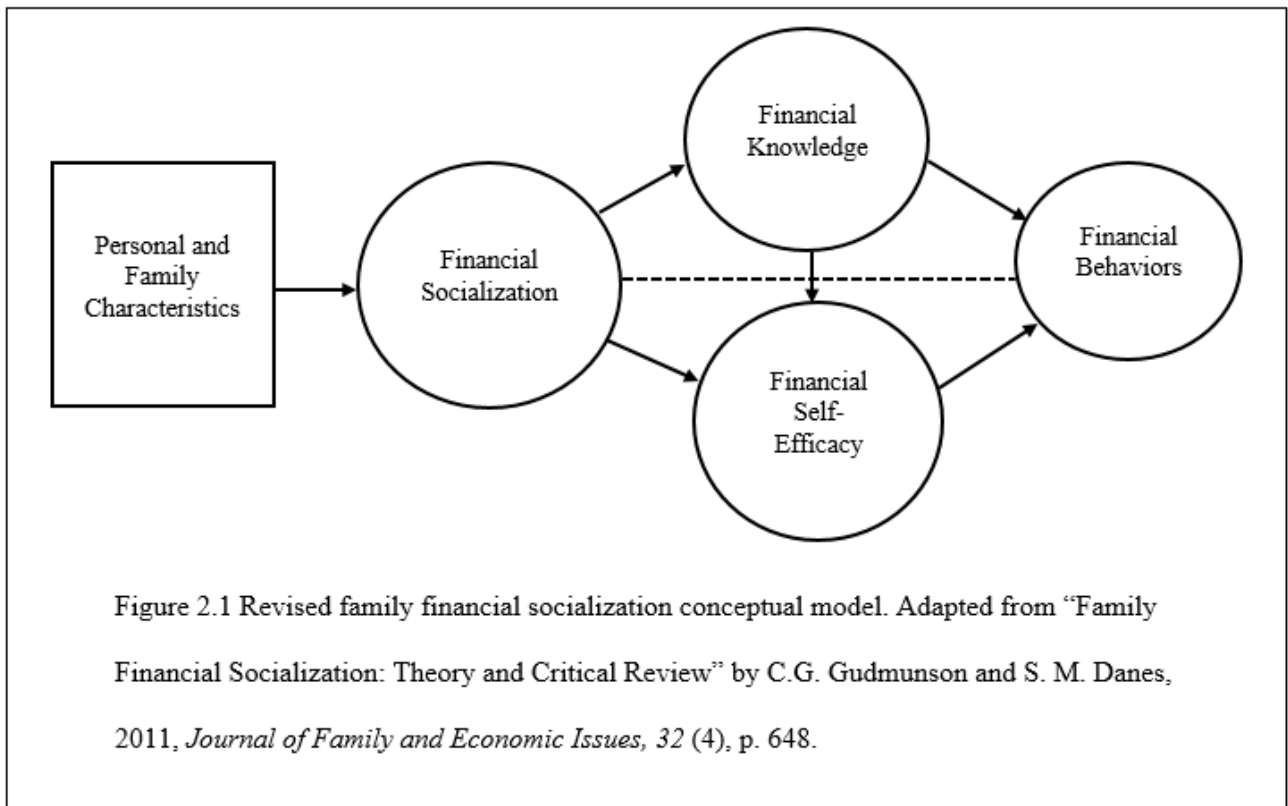
### **Summary**

The current study expands upon the body of literature by exploring the direct and indirect relationships between specific financial socialization practices, financial self-efficacy, financial knowledge, and financial behaviors using the FFS conceptual model. Financial socialization practices studied include parents talking to their children about money, children observing their parents' financial behaviors, formal education at school, working at a job, and direct experience with money. Financial behaviors explored include following a budget, tracking spending, paying bills on time, saving regularly, spending more than earned, and purchasing expensive items they did not need. The family financial socialization model suggests self-efficacy will be influenced by implicit and explicit socialization practices; however, further research is needed to determine whether that influence is positive or negative (Danes & Yang, 2014). Objective financial knowledge was tested as a possible influence on financial self-efficacy. Previous studies have shown mixed results as to whether or not objective financial knowledge influences self-efficacy (Heckman & Grable, 2011; Serido et al., 2013). The family financial socialization model

suggests both implicit and explicit socialization will influence financial knowledge; however, more research is needed to determine whether that influence is enhancing or constraining (Danes & Yang; Gudmunson & Danes, 2011).

According to the FFS model, financial knowledge interacts with self-efficacy to influence financial capabilities; and financial self-efficacy is posited to directly and indirectly influence financial behaviors through its association with socialization (Danes & Yang, 2014; Gudmunson & Danes, 2011). Figure 2.1 shows the revised conceptual model in which the financial knowledge, attitudes, and capabilities construct was divided into separate constructs for financial knowledge and financial self-efficacy to reflect the interaction between socialization, financial knowledge, self-efficacy, and financial behaviors. It is hypothesized financial socialization will directly influence both financial knowledge and financial self-efficacy and through these associations have an indirect relationship with financial behaviors. It is also hypothesized financial knowledge will positively influence financial self-efficacy and both financial knowledge and self-efficacy will be positively associated with financial behaviors.

**Figure 2.1 Revised Family Financial Socialization Conceptual Model**



## **Chapter 3 - Methods**

### **Data**

The current study utilized data from the 2014 National Student Financial Wellness Study (NSFWS, 2014) to perform structural equation modeling (SEM) on the variables of interest. Online surveys were administered to a random sample of college students during the fall 2014 and winter 2015 semesters. The response rate for all institutions that participated in the study was 11.5%, with a total of 18,795 responses. The survey asked a total of 11 questions about financial socialization, allowing for this data to be useful in analyzing explicit and implicit financial socialization processes. Information was also collected on financial knowledge, financial self-efficacy, financial behaviors, and personal and family demographics, which provides the necessary variables to examine the influence of financial socialization on college student financial self-efficacy and financial behaviors, as well as the appropriate variables associated with the family financial socialization conceptual model framework.

The NSFWS data file was prepared using SAS® 9.4 and converted to an Excel comma separated values file in order for SEM to be conducted with Mplus version 8.0. Due to the use of latent constructs, SEM was deemed the appropriate method of analysis for this study. Confirmatory factor analysis (CFA) was conducted to determine the relationship between items and the constructs they represent. All factors for constructs were created based on item correlations and use of the facet method of parceling.

### **Missing Data**

In examining the data, a total of 2,390 responses for the 11 financial socialization survey items were coded “missing-not asked,” as were 4,044 responses for mother’s education, father’s

education, respondent's income, and gender, and 5,635 for GPA. Responses coded as "missing not asked" are due to respondents not completing the questionnaire and were listwise deleted, resulting in a usable sample of 12,598. Self-income was evaluated in three manners: as a continuous variable with "asked but missing" and "prefer not to answer" responses estimated using full information maximum likelihood (FIML), categorically for "prefer not answer" and "answered" responses, and categorically for "do not know" and "answered" to explore if respondents who prefer not to answer income or do not know income are different than those who did specify their income range. For the categorical measurements of income, "asked but missing" responses were placed in a category with the "prefer not to answer" responses. For all other variables "asked but missing" responses were estimated using the full information maximum likelihood (FIML) method in Mplus.

## **Operationalization of Variables**

The following section outlines the operationalization of variables for the current study.

### ***Financial Socialization***

The 2014 NSFWS asked a total of 11 questions on financial socialization which will serve as the measurements for financial socialization. The 11 financial socialization questions were parceled based on correlations and using the facet method, resulting in four factors to measure different facets of financial socialization. According to Danes and Yang (2014), family dynamics, communication, and daily interactions, as well as observed financial skills demonstrated by parents, are considered implicit socialization. For this study, three survey items were used to represent implicit socialization. Students were asked to rate whether they strongly disagree, disagree, agree, or strongly agree for the following questions:

- “Prior to college/university: My parent(s) or guardian(s) were comfortable talking about money with me.”
- “My parent(s) or guardian(s) were role models of sound financial management.”
- “My parent(s) or guardian(s) told me what I needed to know about money management.”

If parents were comfortable talking with the student about money, this represents positive family dynamics and communication. If parents were thought to be good role models of financial management, this represents the behavior the student observed in the household. Point values were assigned to responses ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The implicit socialization factor had a standardized lambda loading of .51 for the construct of financial socialization. A standardized lambda represents the amount each indicator or parcel contributes to the construct (Little, 2013).

Explicit socialization is defined as purposive, direct teaching and practice of financial skills (Danes & Yang, 2014). For this study, explicit socialization was measured using responses to three survey items. Students were asked to answer “yes” or “no” to the following questions:

Prior to college/university:

- “Did your parents or guardians encourage you to save money?”
- “Did your parents or guardians encourage you to open a bank account?”
- “Did your parents or guardians encourage you to invest your money?”

Point values were assigned to responses with “no” equal to 0, and “yes” equal to 1 point. The factor explicit socialization had a standardized lambda loading of .53 on the construct of financial socialization.

A factor measuring financial education was created using responses to two items. Students were asked if they had attended a personal finance class or workshop (1) while in high school or (2) while in college. Responses included: (a) no, (b) yes, one-time event(s), or (c) yes, term long course(s) or repeated sessions. Point values were assigned to responses with “no” = 1 point, “yes, one-time event” = 2 points, and “yes, term long course” = 3 points. The factor financial education had a standardized lambda loading of .34 on the construct financial socialization.

A factor measuring experience with money was created using responses the following three items:

- “Did you ever receive an allowance as a child (age 12 or younger)?”
- “Did you ever receive an allowance as a child (age 13 or older)?”
- “Did you work for pay while in high school?”

Point values were assigned to responses with “no” = 0, and “yes” = 1 point. The factor money experience had a standardized lambda loading of .60 on the construct financial socialization. See Table 3.1 for a full list of items in parcels for all variables. The latent construct financial socialization has a Cronbach’s alpha of .68, boarding on the acceptable range of .70 or higher, indicating an acceptable level of internal consistency in the measure.

### ***Financial Knowledge***

Objective financial knowledge represents actual knowledge about personal finances. Students were asked the following five financial knowledge questions:

- 1) “Imagine that the interest rate on your savings account is 1% per year and inflation is 2% per year. After 1 year, would you be able to buy more than today, exactly the same as today, or less than today?”



- a) More than today
  - b) Exactly the same as today
  - c) Less than today\*
  - d) Don't know
- 2) "Suppose you have \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much would you have in the account if you left the money to grow?"
- a) More than \$102\*
  - b) Exactly \$102
  - c) Less than \$102
  - d) Don't know
- 3) "All paycheck stubs show your gross pay (the total amount you earned before any taxes were taken out for the pay period) and your net pay (the amount of your check after all taxes). The taxes that are commonly taken out include federal, state, and local income tax, Social Security tax, and Medicare tax. On average, what percentage of your income would you expect to receive as take-home pay?"
- a) 100%
  - b) 99-99%
  - c) 80-89%
  - d) 70-79%\*
  - e) Don't know
- 4) "Suppose you borrowed \$5,000 to help cover college expenses for the coming year. You can choose to repay this loan over 10 years, 20 years, or 30 years.

Which of these repayment options will cost you the least amount of money over the length of the repayment period?"

- a) 10-year repayment option\*
- b) 20-year repayment option
- c) 30-year repayment option
- d) Don't know

5) "Which of the following make up the TWO largest components of a credit score?" (select two)

- a) Amounts owed\*
- b) New credit
- c) Types of credit used
- d) Length of credit history
- e) Payment history\*
- f) Don't know

An exploratory factor analysis of the five items produced one factor with an Eigenvalue of 1.80 that included all items except for the question on the two components of a credit score. Removing the credit score question from the scale improved the Cronbach's alpha from a .53 to a .57. A confirmatory factor analysis resulted in a low standardized lambda loading of .21 for the credit score question as well, indicating this item should not be part of the financial knowledge construct. The present study measured the construct objective financial knowledge using the remaining four financial knowledge questions (interest, inflation, take-home pay, and loan repayment). Correct responses were coded as 1, with incorrect responses coded as 0. Standardized lambda loadings for the remaining four financial knowledge questions are as

follows: interest (.61), inflation (.77), take-home pay (.74), loan repayment (.38). While the final Cronbach's alpha was low (.57), it will not be problematic with the use of Structural Equation Modeling (SEM). Little, Lindenberger, and Nesselroade (1999) found that confirmatory analyses techniques are better suited for fitting measurement models than exploratory analyses techniques, as they result in a nearly unbiased estimate of construct correlations.

### ***Financial Self-Efficacy***

Financial self-efficacy represents one's confidence in their ability to manage their personal finances. For the present study, financial self-efficacy was measured using responses to two survey questions. Respondents were asked to rate if they strongly disagree, disagree, agree, or strongly agree with the statements:

- "I am confident I can manage my finances."
- "I manage my money well."

Point values were assigned to responses ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The confidence item had a standardized lambda loading of .71, and the manage money well item had a standardized lambda loading of .66, indicating they are both good measurements for the construct of financial self-efficacy. The Cronbach's alpha for the financial self-efficacy scale is .77, supporting the validity of the construct. With latent constructs that have only two indicators, Heywood cases may occur. Heywood cases are present when a parameter estimate has an illogical value, such as a negative variance or are greater than 1.0 (Kline, 2016). Results were checked and negative variance was not found, indicating this was not an issue.

### ***Financial Behavior***

Financial behavior represents personal financial management activities self-reported by the respondent. For the present study, financial behavior was measured using seven survey items.

Three factors were created to measure the construct of financial behavior based on correlations and using the facet method of parceling. An accounting factor was created using the following three items. Respondents were asked to rate how often they perform the following activities:

- “I have a weekly or monthly budget that I follow.”
- “I track my spending in order to stay within my budget.”
- “I track all debit card transactions/checks to balance my account.”

Responses included never, sometimes, frequently, and always. Point values were assigned ranging from 1 (*never*) to 4 (*always*).

A timeliness factor was created using the following two items:

- “I pay my bills on time every month.”
- “I add to my savings on a regular basis.”

Responses included never, sometimes, frequently, and always. Point values were assigned ranging from 1 (*never*) to 4 (*always*).

A factor measuring “lives within means” was also created using responses to two survey items. Respondents were asked to rate how strongly they agree with the following statements:

- “I regularly spend more money than I have by using credit or borrowing.”
- “In the past three months, I purchased something expensive that I wanted, but did not need.”

Responses included strongly disagree, disagree, agree, and strongly agree. As these are considered negative financial behaviors, the responses were reverse coded, with point values assigned as follows: *strongly disagree* equal to 4, *disagree* equal to 3, *agree* equal to 2, and *strongly agree* equal to 1.

A confirmatory factor analysis indicated all parcels belong to the financial behavior construct, with the following standardized lambda loadings for the factors: accounting (.38), timeliness (.41), and living with means (.62). The latent construct financial behavior has a Cronbach's alpha of .59; however, based on the findings of Little, Lindenberger, and Nesselrode (1999), exploratory analyses techniques should not be heavily relied upon for indicator selection in latent constructs, but rather practical and theoretical considerations should drive indicator selection.

### ***Demographics/Characteristics***

In the family financial socialization conceptual model, personal and family characteristics are thought to influence implicit and explicit socialization (Danes & Yang, 2014). The present study included the highest level of parent education, respondent's current annual income, gender, race, age, grade point average, number of years enrolled in school, and institution type as control variables. Parent(s)/guardian(s) education level were treated as a continuous variable in order for the model to converge in Mplus. Responses for education level included: (a) less than high school, (b) high school diploma or the equivalent, (c) attended college but did not earn a degree, (d) associate's degree, (e) bachelor's degree, (f) master's degree, (g) professional degree, (h) doctorate, and (i) don't know. Professional degree and doctorate were combined into one category, representing professional degrees. Point values were assigned for categories ranging from 1 (*less than high school*) to 7 (*professional degree*) in order to create a continuous variable representing highest level of parent education. Parent education was used as a proxy for parent income as nearly 32% of the sample responded "don't know" or "prefer not to answer" for the survey item regarding parent income. The parent income variable may also be unreliable for those who did answer, as students may have only guessed their parents' income and not actually

know for certain. Respondent's current annual income was treated as a continuous variable. Current annual income responses included: (a) \$0; (b) \$1-\$2,499; (c) \$2,500-\$4,999; (d) \$5,000-\$7,499; (e) \$7,500-\$9,999; (f) \$10,000-\$14,999; (g) \$15,000-\$19,999; (h) \$20,000-\$24,999; (i) \$25,000-\$29,999; (j) \$30,000 or higher; (k) don't know; (l) prefer not to answer. Point values were assigned to categories, ranging from 1 (*no income*) to 10 (*\$30,000 or higher*) in order to treat respondent income as a continuous variable. As more than 12% of the sample responded "don't know" or "prefer not to answer," these responses were treated as separate categories of missing income to determine if these groups vary significantly from those with reported income. Race was categorized as White, Black, Hispanic, Asian, mixed, and other. Prefer not to answer responses to race were treated as "asked but missing" responses and estimated using FIML. Gender was reduced to males and females, as less than one percent of the sample identified as transgender or self-defined. Age and unweighted grade point average (GPA) were treated as continuous variables. First-year students may have reported high school GPA, anticipated GPA, or zero GPA if asked prior completing their first semester at the institution. To account for potential inconsistency in GPA reporting for first-year students, the analyses was conducted both with and without first-year students to determine if there were significant differences in the models. Number of years in school responses included: 1 year, 2 years, 3 years, 4 years, or 5 or more years. In order to compare first-year students to the rest of the sample, number of years in school was treated as a binary categorical variable with first-year students = 1, and other cohorts = 0. Institution type was treated as a categorical variable with categories (a) four-year public; (b) four-year private; and (c) two-year public.

**Table 3.1 Items in Parcels**

| Parcel                         | Items   | Measurement  |
|--------------------------------|---|--|
| <b>Financial Socialization</b> |   |  |
| Implicit Socialization         | My parents were comfortable talking about money w/me.   | Strongly disagree (1), disagree (2), agree (3), strongly agree (4) |
|                                | My parents were role models of sound financial management.  | Strongly disagree (1), disagree (2), agree (3), strongly agree (4) |
|                                | My parents told me what I needed to know about money management.  | Strongly disagree (1), disagree (2), agree (3), strongly agree (4) |
| Explicit Socialization         | My parents encouraged me to save money.   | Yes (1), No (0)  |
|                                | My parents encouraged me to invest my money.  | Yes (1), No (0)  |
|                                | My parents encouraged me to open a bank account.  | Yes (1), No (0)  |
| Experience with Money          | Received an allowance as a child.   | Yes (1), No (0)  |
|                                | Received an allowance as a teen.  | Yes (1), No (0)  |
|                                | Worked for pay while in high school.  | Yes (1), No (0)  |
| Financial Education            | Attended personal finance classes/workshops while in high school.   | No (1), Yes, one-time event (2), yes, term long course (3)         |
|                                | Attended personal finance classes/workshops while in college.   | No (1), Yes, one-time event (2), yes, term long course (3)         |
| <b>Financial Knowledge</b>     |   |  |
| FQ1                            | Imagine that the interest rate on your savings account is 1% per year and inflation is 2% per year. After 1 year, would be able to buy more than today, exactly the same as today, or less than today?  | Less than today (1), else (0)                                      |
| FQ2                            | Suppose you have a \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much would you have in the account if you left the money to grow?   | More than \$102 (1), else (0)                                      |
| FQ3                            | Suppose you borrowed \$5,000 to help cover college expenses for the coming year. You can choose to repay this loan over 10 years, 20 years, or 30 years. Which of these repayment options will cost you the least amount of money over the length of repayment? | 10 years (1), else (0)   |

|                                |   |  |
|--------------------------------|---|--|
| FQ4                            | All paycheck stubs show your gross pay and your net pay....On average, what percentage of your income would you expect to receive as take-home pay? | 70-79% (1), else (0)   |
| <b>Financial Self-Efficacy</b> |   |  |
| FSE1                           | I am confident I can manage my finances.  | Strongly disagree (1), disagree (2), agree (3), strongly agree (4) |
| FSE2                           | I manage my money well.   | Strongly disagree (1), disagree (2), agree (3), strongly agree (4) |
| <b>Financial Behavior</b>      |   |  |
| Timeliness                     | I pay my bills on time every month.   | Never (1), Sometimes (2), Frequently (3), Always (4)               |
|                                | I add to my savings on a regular basis.   | Never (1), Sometimes (2), Frequently (3), Always (4)               |
| Accounting                     | I have a weekly or monthly budget that I follow.  | Never (1), Sometimes (2), Frequently (3), Always (4)               |
|                                | I track my spending in order to stay within my budget.  | Never (1), Sometimes (2), Frequently (3), Always (4)               |
|                                | I track all debit card transactions/checks to balance my account.   | Never (1), Sometimes (2), Frequently (3), Always (4)               |
| Lives within Means             | I regularly spend more money than I have by using credit or borrowing. (Reverse Coded)  | Strongly disagree (4), disagree (3), agree (2), strongly agree (1) |
|                                | In the past three months, I purchased something expensive that I wanted, but did not need. (Reverse Coded)  | Strongly disagree (4), disagree (3), agree (2), strongly agree (1) |

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## **Chapter 4 - Results**

### **Descriptive Statistics**

Table 4.1 provides the summary statistics for the sample. The sample consisted of 12,598 college students from the fall 2014 and winter 2015 semesters. The majority of the sample was female (68%), White (74%), and between ages 18 and 23 (71%). This varies slightly from national post-secondary education statistics for 2014, which reported approximately 57% of college students were female, 60% were White, and 61% were between the ages of 18 and 24 (Snyder, de Brey, & Dillow, 2016). Black, Hispanic, and Asian students were underrepresented in the NSFWS 2014 sample compared to the national college student population. The NSFWS 2014 sample consisted of approximately 5% Black, 5% Hispanic, and 2% Asian students, while the national college student population in 2014 consisted of approximately 15% Black, 15% Hispanic, and 6% Asian students (Snyder et al., 2016). Respondents had lower income levels, with 10% reporting having no income, 15% having income less than \$2,500, and almost 14% having income between \$2,500 and \$4,999. The sample consisted of a relatively equal distribution of students in their first year, second year, third year, fourth year, and five-plus years enrolled. Most respondents had a relatively high GPA, with 71% reporting a GPA between 3.00 and 3.99 and nearly 6% reporting a perfect 4.0 GPA. The high GPA of respondents may be an indication of self-selection bias, in which better performing students opted to participate in the survey, while other students may have chosen not to participate. Approximately 29% of respondents reported the highest level of education obtained by a parent was a Bachelor's degree. Nearly 83% of respondents were from four-year public schools.

With regard to financial socialization, the majority of the sample reported their parents encouraged them to save (86%) and to open a bank account (88%), but very few indicated their parents encouraged them to invest (30%). Less than half of the sample reported receiving an allowance as a child (44%) or as a teenager (37%), but most reported working for pay in high school (76%). Only 31% attended some sort of financial education in high school, and even fewer attended financial education in college (24%). A moderate level of implicit financial socialization was reported with a mean of 3.08 (on a scale of 1 to 4) for “My parents were comfortable talking about money with me”

High levels of financial self-efficacy were reported with a mean of 3.12 for “I am confident I can manage my finances” on a scale of 1 to 4. The financial knowledge level of the respondents was average, with a mean of 2.64 on a scale of 1 to 4. The majority of the sample were able to answer the repayment options question correctly (80%) and the interest rate question correctly (80%), while less than half could answer the question on take-home pay correctly (44%). Most reported positive financial behaviors, with a mean of 3.63 for pays bills on time, a mean of 2.93 for track spending to stay within budget, and a mean of 2.6 for follows a budget (all on a scale of 1 to 4). See Table 4.1 for full results.

**Table 4.1 Summary Statistics**

| Variables   | Full Sample         |              | First Year          |         | Other Cohorts       |              |
|---|---------------------|--------------|---------------------|---------|---------------------|--------------|
|   | Proportion/<br>Mean | Missing      | Proportion/<br>Mean | Missing | Proportion/<br>Mean | Missing      |
|   | <i>N</i> = 12,598   | ( <i>n</i> ) | <i>n</i> = 2,296    |         | <i>n</i> = 10,302   | ( <i>n</i> ) |
| <b>Financial Socialization</b>                    |                     |              |                     |         |                     |              |
| Implicit Socialization Factor                     |                     |              |                     |         |                     |              |
| Parents comfortable talking about money (1-4)     | 3.08                | 41           | 3.22                | 9       | 3.05                | 32           |
| Parents taught money management (1-4)             | 2.87                | 45           | 2.84                | 11      | 2.84                | 34           |
| Parents role models of sound financial mgmt (1-4) | 2.89                | 51           | 2.87                | 12      | 2.87                | 39           |
| Experience with Money Factor                      |                     |              |                     |         |                     |              |
| Received allowance prior to age 12                | 43.50%              | 14           | 41.02%              | 2       | 44.05%              | 12           |
| Received allowance as teenager                    | 36.99%              | 23           | 34.25%              | 4       | 37.60%              | 19           |
| Worked for pay in high school                     | 75.46%              | 12           | 74.59%              | 2       | 75.65%              | 10           |
| Explicit Socialization Factor                     |                     |              |                     |         |                     |              |
| Parents encouraged saving                         | 86.37%              | 18           | 90.19%              | 3       | 85.52%              | 15           |
| Parents encouraged bank account                   | 88.07%              | 19           | 89.40%              | 4       | 87.77%              | 15           |
| Parents encouraged investing                      | 29.59%              | 23           | 31.32%              | 7       | 29.20%              | 16           |
| Financial Education Factor                        |                     |              |                     |         |                     |              |
| Attended financial education in HS                | 30.75%              | 73           | 39.66%              | 14      | 28.76%              | 59           |
| Attended financial education in college           | 23.54%              | 67           | 17.22%              | 14      | 24.95%              | 53           |
| <b>Financial Knowledge</b>                        |                     |              |                     |         |                     |              |
| Inflation correct                                 | 59.76%              |              | 52.57%              |         | 61.37%              |              |
| Interest correct                                  | 79.78%              |              | 74.04%              |         | 81.06%              |              |
| Repayment options correct                         | 80.11%              |              | 73.91%              |         | 81.50%              |              |
| Percent take home pay correct                     | 44.44%              |              | 40.42%              |         | 45.33%              |              |
| Credit score correct                              | 38.30%              |              | 40.81%              |         | 37.74%              |              |

**Financial Self-efficacy**

|                               |      |    |      |   |      |    |
|-------------------------------|------|----|------|---|------|----|
| Confident can manage finances | 3.12 | 42 | 3.07 | 7 | 3.13 | 35 |
| Manage money well             | 3.03 | 49 | 3.03 | 8 | 3.03 | 41 |

**Financial Behaviors**

## Personal Accounting Factor

|                            |      |    |      |    |      |    |
|----------------------------|------|----|------|----|------|----|
| Follows budget (1-4)       | 2.6  | 40 | 2.5  | 5  | 2.62 | 35 |
| Tracks spending (1-4)      | 2.93 | 69 | 2.92 | 14 | 2.93 | 55 |
| Tracks checks/debits (1-4) | 3.12 | 84 | 3.17 | 9  | 3.1  | 75 |

## Timeliness Factor

|                         |      |    |      |    |      |    |
|-------------------------|------|----|------|----|------|----|
| Pay bills on time (1-4) | 3.63 | 84 | 3.57 | 23 | 3.64 | 61 |
| Saves regularly (1-4)   | 2.38 | 76 | 2.48 | 12 | 2.36 | 64 |

## Lives within Means Factor

|  |      |    |      |    |      |    |
|--|------|----|------|----|------|----|
| Regularly spends more than income w/credit<br>(RC 1-4)           | 3.36 | 50 | 3.53 | 12 | 3.32 | 43 |
| Purchased something expensive wanted but didn't<br>need (RC 1-4) | 2.85 | 55 | 2.82 | 8  | 2.86 | 42 |

**Gender**

|         |        |  |        |  |        |  |
|---------|--------|--|--------|--|--------|--|
| Male    | 32.12% |  | 29.92% |  | 32.62% |  |
| Female  | 67.66% |  | 69.77% |  | 67.19% |  |
| Missing | 0.22%  |  | 0.31%  |  | 0.19%  |  |

**Age**

|                 |        |  |        |  |        |  |
|-----------------|--------|--|--------|--|--------|--|
| Age 18-23       | 71.27% |  | 87.76% |  | 67.59% |  |
| Age 24-29       | 13.82% |  | 3.70%  |  | 16.07% |  |
| Age 30-39       | 8.44%  |  | 3.92%  |  | 9.44%  |  |
| Age 40 or older | 6.29%  |  | 3.79%  |  | 6.84%  |  |
| Missing         | 0.19%  |  | 0.83%  |  | 0.05%  |  |

|                            |        |        |        |  |
|----------------------------|--------|--------|--------|--|
| <b>Race</b>                |        |        |        |  |
| White                      | 73.73% | 71.78% | 74.17% |  |
| Black                      | 4.73%  | 5.18%  | 4.63%  |  |
| Hispanic                   | 5.31%  | 5.27%  | 5.32%  |  |
| Asian                      | 1.54%  | 5.58%  | 5.22%  |  |
| Mixed race                 | 7.76%  | 9.67%  | 7.33%  |  |
| Other                      | 1.54%  | 0.92%  | 1.68%  |  |
| Missing                    | 5.39%  | 1.60%  | 1.65%  |  |
| <b>GPA</b>                 |        |        |        |  |
| 0.00 - .99                 | 0.31%  | 1.13%  | 0.13%  |  |
| 1.00 - 1.99                | 0.80%  | 0.91%  | 0.78%  |  |
| 2.00 - 2.99                | 22.49% | 15.42% | 24.06% |  |
| 3.00 - 3.99                | 70.79% | 69.03% | 71.18% |  |
| 4.00                       | 5.61%  | 13.50% | 3.85%  |  |
| <b>Respondent's Income</b> |        |        |        |  |
| No income                  | 10.44% | 24.31% | 9.29%  |  |
| Less than \$2,500          | 15.02% | 28.28% | 14.76% |  |
| BT \$2,500 - \$4,999       | 13.51% | 17.77% | 14.88% |  |
| BT \$5,000 - \$7,499       | 9.46%  | 9.04%  | 11.14% |  |
| BT \$7,500 - \$9,999       | 7.87%  | 5.23%  | 9.75%  |  |
| BT \$10,000 - \$14,999     | 10.14% | 4.97%  | 12.92% |  |
| BT \$15,000 - \$19,999     | 5.18%  | 2.20%  | 6.67%  |  |
| BT \$20,000 - \$24,999     | 4.52%  | 2.61%  | 5.67%  |  |
| BT \$25,000 - \$29,999     | 2.83%  | 1.46%  | 3.58%  |  |
| GT \$30,000                | 8.87%  | 4.13%  | 11.34% |  |
| Don't know                 | 6.26%  | 9.32%  | 5.58%  |  |

|                              |       |       |       |
|------------------------------|-------|-------|-------|
| Prefer not to answer/Missing | 5.91% | 7.36% | 5.60% |
|------------------------------|-------|-------|-------|

**Parent's Income**

|                              |        |        |        |
|------------------------------|--------|--------|--------|
| LT \$15,000                  | 4.64%  | 6.96%  | 6.80%  |
| BT \$15,000 - \$29,999       | 6.60%  | 9.99%  | 9.66%  |
| BT \$30,000 - \$39,999       | 6.90%  | 9.99%  | 10.20% |
| BT \$40,000 - \$59,999       | 10.37% | 15.27% | 15.29% |
| BT \$60,000 - \$79,999       | 10.60% | 13.85% | 16.02% |
| BT \$80,000 - \$99,999       | 9.20%  | 14.05% | 13.44% |
| BT \$100,000 - \$149,999     | 11.03% | 16.56% | 16.19% |
| GT \$150,000                 | 8.53%  | 13.34% | 12.40% |
| Don't know                   | 22.57% | 22.69% | 22.54% |
| Prefer not to answer/Missing | 9.56%  | 9.71%  | 9.52%  |

**Highest Parent Education Level**

|                     |        |        |        |
|---------------------|--------|--------|--------|
| Less than HS        | 2.80%  | 2.70%  | 2.82%  |
| HS                  | 14.01% | 12.06% | 14.44% |
| Some college        | 12.76% | 12.24% | 12.88% |
| Associates degree   | 13.34% | 13.20% | 13.88% |
| Bachelors degree    | 28.67% | 29.66% | 28.44% |
| Graduate degree     | 17.53% | 18.68% | 17.27% |
| Professional degree | 7.88%  | 89.19% | 7.81%  |
| Don't know/Missing  | 3.01%  | 3.27%  | 2.95%  |

**Institution Type**

|                |        |        |        |
|----------------|--------|--------|--------|
| 2 year public  | 8.20%  | 11.54% | 7.45%  |
| 4 year public  | 82.59% | 78.57% | 83.49% |
| 4 year private | 9.21%  | 9.89%  | 9.06%  |

|                                 |        |         |        |
|---------------------------------|--------|---------|--------|
| <b>Number of years enrolled</b> |        |         |        |
| First year                      | 18.23% | 100.00% |        |
| Second year                     | 19.57% |         | 23.94% |
| Third year                      | 22.25% |         | 27.21% |
| Fourth year                     | 20.51% |         | 25.08% |
| Five or more years              | 19.20% |         | 23.48% |
| Missing                         | 0.24%  |         | 0.29%  |

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## Confirmatory Factor Analysis

Using the fixed factor method of scale setting with the scale set to 1, a confirmatory factor analysis (CFA) was first conducted with individual items to determine how the items were correlated with the constructs they were intended to represent. Setting the scale to 1 allows for the relationship between latent factors to be estimated in a standardized metric, as well as for the estimates between latent constructs to be interpreted as correlations (Little, 2013). Table 4.2 displays the CFA correlation matrix for items pre-parcel. Items with standardized lambdas lower than .30 were removed from analysis, as this was an indication that the item did not correlate well with the construct it was intended to measure. Only one item, the financial knowledge question regarding components of a credit score, had a lambda loading of less than .30. This question differed from all other survey items as it required students to correctly identify more than one answer.

**Table 4.2 Confirmatory Factor Analysis Results for Latent Constructs without Parcels ( $N = 12,598$ )**

| Parameter                                       | Unstandardized |       | Standardized |       |
|---|----------------|-------|--------------|-------|
|   | b              | SE    | $\beta$      | SE    |
| Financial Socialization (FS)                    |                |       |              |       |
| FS→FS1: Parents Comfortable Talking about Money | 3.41           | 0.021 | 0.58         | 0.002 |
| FS→FS2: Parents Taught Money Management         | 3.41           | 0.023 | 0.56         | 0.002 |
| FS→FS3: Parent Financial Role Models            | 3.43           | 0.024 | 0.53         | 0.002 |
| FS→FS4: Received Allowance as Child             | 3.01           | 0.01  | 0.90         | 0.001 |
| FS→FS5: Received Allowance as Teen              | 3.00           | 0.016 | 0.70         | 0.002 |
| FS→FS6: Worked in HS                            | 2.99           | 0.012 | 0.96         | 0.002 |
| FS→FS7: Encouraged to Save                      | 3.00           | 0.017 | 0.79         | 0.002 |
| FS→FS8: Encouraged to Invest                    | 3.00           | 0.019 | 0.77         | 0.002 |



|  |      |       |      |       |
|--|------|-------|------|-------|
| FS→FS9: Encouraged to Open Bank Account  | 2.99 | 0.017 | 0.70 | 0.002 |
| FS→FS10: HS Financial Education          | 2.48 | 0.036 | 0.32 | 0.003 |
| FS→FS11: College Financial Education     | 2.50 | 0.038 | 0.34 | 0.003 |
| Financial Self-Efficacy (FSE)            |      |       |      |       |
| FSE→FSE1: Confident in Money Management  | 4.15 | 0.033 | 0.71 | 0.003 |
| FSE→FSE2: Manage Money Well              | 4.15 | 0.033 | 0.66 | 0.002 |
| Financial Knowledge (FK)                 |      |       |      |       |
| FK→FK1: Inflation                        | 0.66 | 0.12  | 0.66 | 0.012 |
| FK→FK2: Interest                         | 0.79 | 0.014 | 0.79 | 0.014 |
| FK→FK3: Loan Repayment                   | 0.75 | 0.014 | 0.75 | 0.014 |
| FK→FK4: Take-home Pay                    | 0.42 | 0.013 | 0.42 | 0.013 |
| FK→FK5: Components of Credit Score       | 0.21 | 0.015 | 0.21 | 0.015 |
| Financial Behavior (FB)                  |      |       |      |       |
| FB→FB1: Spend More than Income           | 2.59 | 0.023 | 0.55 | 0.003 |
| FB→FB2: Purchased Want vs. Need          | 2.56 | 0.018 | 0.57 | 0.002 |
| FB→FB3: Budget                           | 2.66 | 0.021 | 0.66 | 0.003 |
| FB→FB4: Tracks Spending                  | 3.18 | 0.035 | 0.60 | 0.003 |
| FB→FB5: Pay Bills on Time                | 3.43 | 0.058 | 0.59 | 0.005 |
| FB→FB6: Regularly Saves                  | 3.70 | 0.037 | 0.67 | 0.003 |
| FB→FB4: Tracks Checks/Debit Transactions | 3.25 | 0.041 | 0.56 | 0.004 |

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A correlation matrix was run in SAS® to check for multicollinearity, and to identify items that may parcel well together. Correlations greater than .80 are an indication of multicollinearity (Field and Miles, 2010). No multicollinearity issues were present in the data as all correlations were less than .65. Table A.1 in the Appendix presents the full correlation matrix for all variables used in the model. Items were then parceled for each construct based on correlations and the facets of the construct they represent. Items in parcels were averaged to retain the original metrics of the scale and for ease in comparing means and variances (Little, 2013). Financial socialization had 11 items parceled into four factors: implicit socialization, explicit socialization, financial education, and experience with money. Financial knowledge

consisted of only four items and was not parceled. Financial self-efficacy consisted of two items and was not parceled; however, because the construct consisted of only two items, the variances between the two items were set to equal. Financial behavior consisted of seven items and was parceled into three factors: accounting, timeliness, and living within means. A second CFA was conducted after parceling to check that the parcels had acceptable lambda loadings for each construct. Table 4.3 presents the parceled CFA correlation matrix. A third CFA was conducted with covariates included with the parceled items to test the proposed model in Figure 2.1. Delta parameterization was used, which sets the total variance of the latent variables to one and requires parameter coefficients to be interpreted as the change in standard deviation for a given latent variable, relative to a one standard deviation change in a common factor (Kline, 2016).

**Table 4.3 Confirmatory Factor Analysis Results for Latent Constructs with Parcels ( $N = 12,598$ )**

| Parameter                               | Unstandardized |      | Standardized |      | $R^2$    |
|---|----------------|------|--------------|------|----------|
|   | b              | SE   | $\beta$      | SE   |          |
| Financial Socialization (FS)            |                |      |              |      | 0.019*** |
| FS→FS1: Implicit Socialization          | 3.51           | 0.04 | 0.51         | 0.00 | 0.26***  |
| FS→FS2: Explicit Socialization          | 2.82           | 0.04 | 0.53         | 0.01 | 0.28***  |
| FS→FS3: Experience w/Money              | 2.57           | 0.04 | 0.60         | 0.01 | 0.35***  |
| FS→FS4: Financial Education             | 2.68           | 0.06 | 0.34         | 0.01 | 0.12***  |
| Financial Self-Efficacy (FSE)           |                |      |              |      | 0.03***  |
| FSE→FSE1: Confident in Money Management | 4.12           | 0.03 | 0.71         | 0.00 | 0.50***  |
| FSE→FSE2: Manage Money Well             | 4.12           | 0.03 | 0.66         | 0.00 | 0.43***  |
| Financial Knowledge (FK)                |                |      |              |      | 0.00     |
| FK→FK1: Inflation                       | 0.60           | 0.01 | 0.60         | 0.01 | 0.36***  |
| FK→FK2: Interest                        | 0.78           | 0.02 | 0.78         | 0.02 | 0.60***  |
| FK→FK3: Loan Repayment                  | 0.73           | 0.02 | 0.73         | 0.02 | 0.53***  |

|                          |      |      |      |      |         |
|--------------------------|------|------|------|------|---------|
| FK→FK4: Take-home Pay    | 0.36 | 0.02 | 0.36 | 0.02 | 0.13*** |
| Financial Behavior (FB)  |      |      |      |      | 0.82*** |
| FB→FB1: Timeliness       | 1.66 | 0.05 | 0.40 | 0.01 | 0.16*** |
| FB→FB2: Accounting       | 1.56 | 0.04 | 0.38 | 0.00 | 0.14*** |
| FB→FB3: Lives w/in Means | 2.05 | 0.04 | 0.62 | 0.00 | 0.39*** |

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## Model Fit

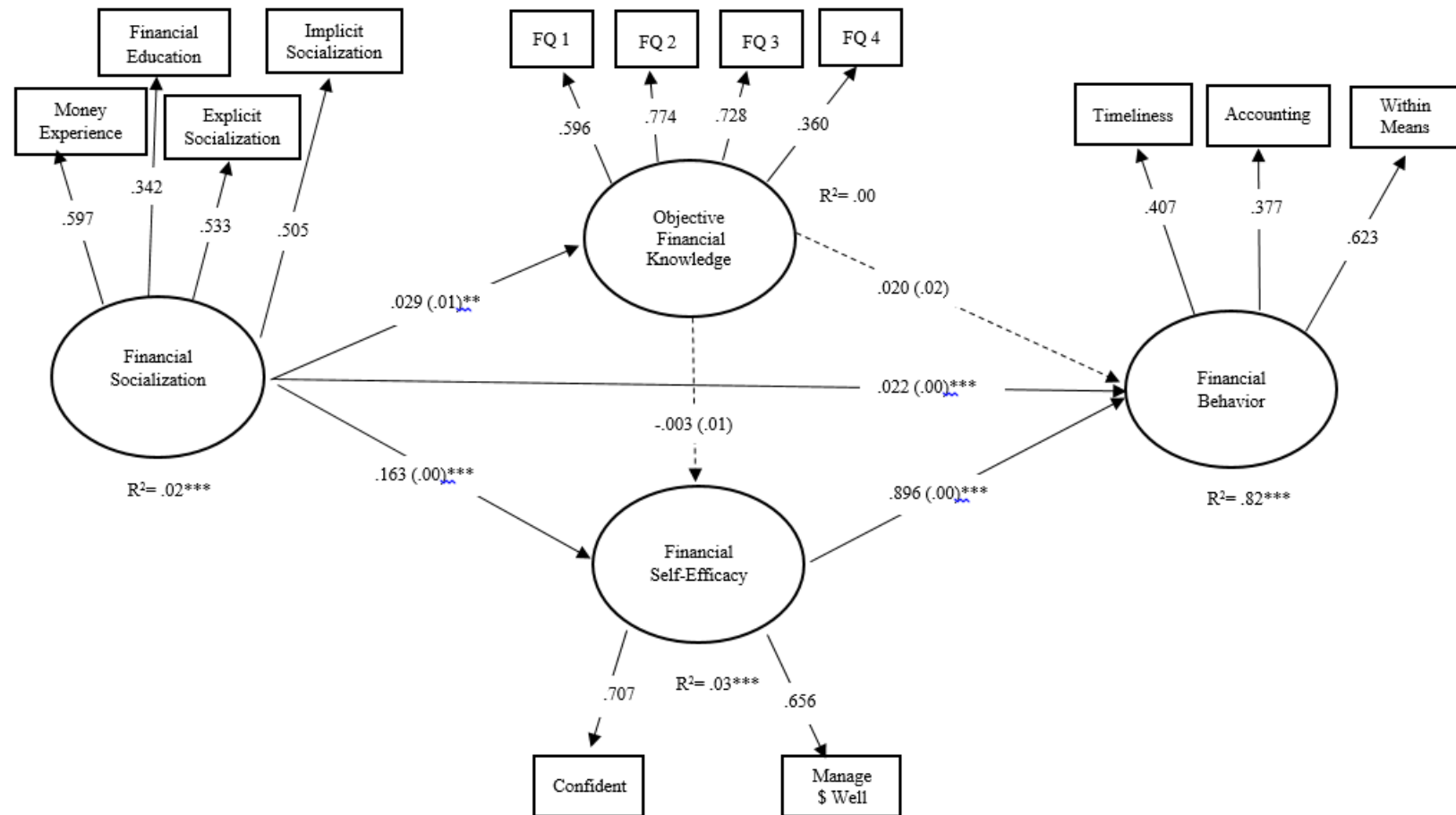
The model chi-square exact fit indices was significant, suggesting that the model should be rejected ( $\chi^2 [216] = 4385.80, p < .001$ ). The chi-square test estimates are extremely sensitive to a large sample size and a large number of degrees of freedom and will be significant for most models (Little, 2013). As this sample is large at 12,598 observations, it is not surprising that the chi-square test is significant since models with a sample size greater than 400 typically always have a statistically significant chi-square value (Kenny, 2015). The Root Mean Square Error of Approximation (RMSEA) measures absolute fit by comparing the saturated model to the estimated model (Little, 2013). RMSEA for the model is .039, indicating the model is a close fit (90% CI = .038, .040). The comparative fit index (CFI) for the model is .87 indicating a mediocre fit, with the model being an 87% improvement over the null model. The Tucker – Lewis Index (TLI) for the model is .85, also indicating a mediocre fit. Based on the RMSEA, CFI, and TLI indices, the model was retained.

## Structural Model Results

Figure 4.1 presents a diagram of the statistically significant direct effects from the tested model. The model provides some support for the Family Financial Socialization conceptual model developed by Gudmunson and Danes (2011). Both direct and indirect relationships were found between financial socialization and financial behaviors in college students. Overall the model explains 81% of the variance in financial behavior ( $R^2 = .81$ ), 2% of the variance in

financial socialization ( $R^2 = .02$ ), none of the variance in objective financial knowledge ( $R^2 = .00$ ), and only 3% of the variance in financial self-efficacy ( $R^2 = .03$ ).

**Figure 4.1 Significant Pathways in Structural Model Predicting Financial Behavior ( $N = 12,598$ )\***



\*Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Model Fit Indices:  $\chi^2(216) = 4,385.80$ ,  $p < .001$ ; RMSEA = .039, 90% CI [.038, .040], CFI = .87, TLI = .85. All results were computed with Mplus in delta parameterization and STDYX standardization. The structural model was estimated with indicators from the measurement model for the latent variables and controls for gender, age, race, income, parent education, GPA, years enrolled in school, and institution type.

### ***Direct Effects***

Supporting Hypothesis 1, a direct relationship between financial socialization and objective financial knowledge was found. A one standard deviation increase in financial socialization predicted a 3% increase in the standard deviation of objective financial knowledge ( $\beta = .03$ ,  $p < .01$ ). Financial socialization was also found to have a direct and positive affect on financial self-efficacy, supporting Hypothesis 2. For every one standard deviation increase in financial socialization, the standard deviation of financial self-efficacy increased by 16% ( $\beta = .16$ ). Hypothesis 3 was also supported, with a direct and positive relationship found between financial socialization and financial behavior. For every one standard deviation increase in financial socialization, the standard deviation of positive financial behavior increased by 2% ( $\beta = .020$ ). Financial self-efficacy was found to have the greatest influence on financial behaviors, with a 90% ( $\beta = .90$ ) increase in the standard deviation of positive financial behavior for every one standard deviation increase in self-efficacy. The direct and positive relationship between self-efficacy and behavior supports Hypothesis 8. Objective financial knowledge was not found to influence financial self-efficacy or financial behavior, contrary to Hypotheses 6 and 7. Direct effects for the full model are shown in Table 4.4.

No significant differences were found between males and females with regard to financial socialization. Significant differences among races were found in financial socialization, with Blacks, Asians, Hispanics, and other races receiving less financial socialization than Whites. Respondent income, parent education, and institution type had no significant associations with financial socialization. Age was negatively associated with financial socialization, while GPA was positively associated with financial socialization. First-year students as compared to students enrolled two or more years reported significantly less financial socialization ( $\beta = -.03$ ).

**Table 4.4 Direct Effects with Financial Behavior (*N* = 12,598)**

| Parameter                                   | Unstandardized |      | Standardized* |      |        |
|---|----------------|------|---------------|------|--------|
|   | b              | SE   | $\beta$       | SE   | p      |
| Financial Self-Efficacy→Financial Behavior  | 2.028          | 0.03 | 0.896         | 0.00 | .00*** |
| Financial Knowledge→Financial Behavior      | 0.046          | 0.03 | 0.020         | 0.02 | 0.18   |
| Financial Socialization→Financial Behavior  | 0.050          | 0.01 | 0.022         | 0.00 | .00*** |
| Financial Self-Efficacy→Fin. Knowledge      | -.003          | 0.01 | -.003         | 0.01 | 0.8    |
| Financial Self-Efficacy→Fin. Socialization  | 0.164          | 0.00 | 0.163         | 0.00 | .00*** |
| Financial Knowledge→Fin. Socialization      | 0.028          | 0.01 | 0.029         | 0.01 | .01**  |
| Female→Financial Socialization              | -.041          | 0.03 | -0.019        | 0.01 | 0.15   |
| Black→Financial Socialization               | -.277          | 0.05 | -0.058        | 0.01 | .00*** |
| Asian→Financial Socialization               | -.199          | 0.05 | -0.044        | 0.01 | .00*** |
| Hispanic→Financial Socialization            | -.148          | 0.06 | -0.033        | 0.01 | .01**  |
| Mixed Race→Financial Socialization          | -.049          | 0.05 | -0.013        | 0.01 | 0.32   |
| Other Race→Financial Socialization          | -.389          | 0.07 | -0.047        | 0.01 | .00*** |
| Income→Financial Socialization              | 0.000          | 0.00 | 0.013         | 0.01 | 0.34   |
| Parent Education→Financial Socialization    | -.001          | 0.09 | 0.000         | 0.01 | 0.99   |
| Four-Year Private→Financial Socialization   | -.031          | 0.04 | -.009         | 0.01 | 0.43   |
| Two-Year Public→Financial Socialization     | -.020          | 0.04 | -0.005        | 0.01 | 0.65   |
| Age→Financial Socialization                 | -.012          | 0.00 | -.087         | 0.01 | .00*** |
| GPA→Financial Socialization                 | 0.075          | 0.03 | 0.039         | 0.01 | .00**  |
| First Year Students→Financial Socialization | -.070          | 0.03 | -.027         | 0.01 | .02*   |
| R-Squared                                   | .81            |      |               |      |        |

\*Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$  All results were computed with Mplus in delta parameterization and STDYX standardization.

Overall Model Fit Indices:  $\chi^2(216) = 4,385.80$ ,  $p = < .001$ ; RMSEA = .039, 90% CI [.038, .040], CFI = .87, TLI = .85.

Reference Groups: male, White, four-year public, students enrolled two or more years

### ***Indirect Effects***

An indirect relationship between financial socialization and financial behavior through financial knowledge was proposed in Hypothesis 5 but was not supported, as there was no direct relationship found between financial knowledge and financial behavior. Hypothesis 4 was supported, with a positive indirect relationship found between financial socialization, financial self-efficacy, and financial behavior. A one standard deviation increase in financial socialization was associated with a 15% increase in the standard deviation of positive financial behaviors through increased financial self-efficacy ( $\beta = .15, p < .001$ ).

### ***Alternative Models***

Due to the low CFI of the original model and lower lambda loadings for financial education with financial socialization, an alternative model splitting out financial socialization into two constructs, parental financial socialization and financial education, was conducted. The alternative model did not improve model fit [ $(\chi^2_{diff}[10] = 1,531)$ ;  $(\chi^2(df 226) = 5917.360, p = < .001)$ ; CFI = .86; RMSEA = .045, CI .044, .046], and was therefore rejected; however, it did yield some interesting results. Shown in Figure A.1 in the Appendix, the path from financial socialization to financial education was found to have a positive and significant relationship. For every one standard deviation increase in parent financial socialization, the standard deviation of financial education increased by almost 53% ( $\beta = .525, p < .001$ ). Both parent financial socialization and financial education were found to increase financial self-efficacy, with a one standard deviation parental socialization increasing the standard deviation of self-efficacy by 13% ( $\beta = .131$ ) and financial education increasing the standard deviation of self-efficacy by almost 3% ( $\beta = .025$ ). Surprisingly, neither financial education nor parental financial



socialization significantly increased financial knowledge. A one standard deviation increase in financial education was associated with a 3% ( $\beta = .031$ ) standard deviation increase in positive financial behaviors, as was parent financial socialization ( $\beta = .029$ ). Results of covariates with parent financial socialization were similar to the original model; however, only gender and age were significantly associated with financial education. Women were less likely to attend financial education ( $\beta = -.042$ ), while age was positively associated with attending financial education ( $\beta = .031$ ). Table A.2 and Figure A.1 in the Appendix show the full results of direct effects for the alternative split socialization model, while Table A.3 in the Appendix shows the full results of the indirect effects of the alternative split socialization model.

Because the reliability of GPA reporting for first-year students was questionable, the model was conducted both with and without first-year students to test for model sensitivity for GPA. No differences in direction or significance was found in the model when first-year students were excluded. Results for the model excluding first-year students can be found in the Appendix, Table A.3.

Approximately 6% of the sample indicated they did not know their income. Not knowing one's income suggests a lack of financial awareness and may be an indication of socialization differences. A separate model was conducted to determine if there were differences in socialization for those who indicated they did not know their income compared to those who did know their income. No significant differences in financial socialization were found between these two groups. See Table A.4 in the Appendix for full results.

Six percent of the sample also answered "prefer not to answer" for the income item. A preference to keep income private may be a result of financial socialization, in which parents may have taught the child not to discuss income or finances with others. A separate model was

conducted to determine if there were differences in socialization for those who preferred not to answer their income as compared to those who did answer the income item. No significant differences in financial socialization were found between these two groups. See Table A.5 in the Appendix for full results.

## **Chapter 5 - Discussion**

This study examined the direct and indirect relationships between financial socialization, financial knowledge, financial self-efficacy, and financial behavior using Gudmunson and Danes' (2011) Family Financial Socialization conceptual model (FFS) to guide the hypotheses. Analysis was conducted using Structural Equation Modeling (SEM) due to the use of latent constructs and the need to explore the direct and indirect effects among the variables. Results of the study show strong support for the FFS conceptual model, along with insight into the important predictors of financial self-efficacy and positive financial behavior.

### **Financial Socialization**

#### **Demographics and Financial Socialization**

While not the focus of this study, the relationship between the demographic variables and financial socialization revealed some intriguing results. In the combined financial socialization model, there were no significant differences in financial socialization between males and females. These results contradict previous findings which indicate females are more likely to have discussions with parents' and peers' regarding finances, and more likely to observe parents' and peers' financial behaviors (Gutter et al., 2009; Gutter & Garrison, 2010). The difference in results could be attributed to socialization measurements, as the present study included a broader range of financial socialization factors. In the split socialization model, the results indicate there is a difference in financial socialization between males and females with regard to financial education. Being female was negatively associated with participating in financial education. There were no significant differences in parental socialization between males and females in the split socialization model. Looking more closely at the split model, there was a strong, positive

association between parental financial socialization and formal financial education, suggesting that parental financial socialization is an important factor in whether or not a student participates in a personal finance class or workshop while in high school or college. Gender differences in financial education could possibly be attributed to parents suggesting to their sons to enroll in financial education courses, but not their daughters. More research is needed to determine if there is an indirect relationship between gender, parental socialization, and participation in financial education courses.

Difference in financial socialization were also found among races. Compared to White respondents, Black, Asian, Hispanic, and other races reported less financial socialization. This finding opposes Gutter, Copur, and Garrison's (2009) study, which found that White students were less likely to discuss finances with their parents or peers than students of other races. The difference in financial socialization between races was found to be significant in parental financial socialization, but not in formal financial education, according to the split socialization model. This suggests there may be cultural differences in willingness of parents to discuss financial matters with their children.

Age was negatively related to financial socialization, indicating the older a student was, the less financial socialization they received. The relationship between age and financial socialization supports Gutter, Copur, and Garrison's (2009) findings that older students were less likely to discuss personal finances with parents or to observe parents' financial behaviors. The negative relationship between age and financial socialization might be attributed to generational differences in financial socialization. It could be that parents of older students did not discuss finances with their child growing up because it was not socially acceptable to talk about financial matters. Another possible explanation is that as the student ages, the more financially

independent they become, and the less need for financial socialization from their parents. Results of the split socialization model indicate that age is negatively associated with parental financial socialization, but positively associated with formal financial education. The number of years a student was enrolled was also significantly related to financial socialization. Compared to other cohorts, first year students received less financial socialization. First year students are often living in the dorm and participating in meal plans, or still living at home with their parents, which removes the immediate responsibility of paying rent and bills, and the need to budget finances. Parents may wait to engage in certain financial conversations with their child such as how to create a budget, timeliness of bill payments, and use of credit, until the child moves off-campus. The split model of socialization supports this possibility, as first year students did receive significantly less parental financial socialization than other cohorts. No difference was found between first year students and other cohorts in regards to formal financial education.

### **Financial Socialization and Financial Knowledge**

The retained model showed a positive relationship between financial socialization and financial knowledge, consistent with previous research (Lapp, 2010; Shim et al., 2009; Shim et al., 2010); however, in the alternative split model of financial socialization, neither parental financial socialization nor formal financial education alone were significantly related to financial knowledge. Formal financial education bordered on statistical significance at the  $p < .10$  level, yet parental financial socialization was nowhere near statistical significance. This suggests that there may be an interacting relationship between formal financial education and parental financial socialization that influences financial knowledge. Children who receive formal financial education at school may discuss what they are learning with their parents, providing parents with the opportunity to discuss their own financial attitudes and beliefs with their

children, and thereby teaching their children more about managing their finances and strengthening their financial knowledge. The fact that formal financial education borders on statistical significance provides support for findings from Shim and associates (2010), Lapp (2010), and Kaiser and Menkhoff (2017), all of which found financial education to have a positive relationship with financial knowledge. Differences in the strength and level of significance may also be attributed to a difference in financial knowledge measurements.

### **Financial Socialization and Financial Self-Efficacy**

Within the model, the relationship between financial socialization and financial self-efficacy was the second strongest association between variables. While other studies have found weak or mixed results (Heckman & Grable, 2011; Lee & Mortimer, 2009), the present study found financial socialization to have a positive influence on financial self-efficacy. The alternative split model of financial socialization shows that parental financial socialization has a much stronger influence on financial self-efficacy than formal financial education, though both were significantly related to increased self-efficacy. Of the financial socialization practices included in this study, the experience with money parcel ( $\lambda = .60$ ) and two of the indicators within this parcel (working for pay while in high school,  $\lambda = .96$ ; receiving an allowance as a child,  $\lambda = .90$ ) contained the highest correlations with the financial socialization construct. Providing children with experience in earning and managing money is an important factor in increasing their financial self-efficacy and teaching them positive financial behavior. These results support Bandura's (1977) theory of self-efficacy, which posits that self-efficacy is inferred from our experiences mastering a task and comparison of our capabilities to others. What parents teach their children from direct conversations about finances, experiences the child has managing money earned from working or allowance, and the financial behaviors parents

model around their children instill confidence in the child's belief that they can successfully manage their finances.

### **Financial Socialization and Financial Behavior**

In accordance with previous research, financial socialization was found to have a direct, positive influence on financial behaviors (Cho et al., 2012; Kim & Chatterjee, 2013; Webley & Nyhus, 2006). Among the individual activities included in the financial socialization factors, working for pay while in high school yielded the strongest correlation at  $\beta = .96$ , suggesting this is a compelling way for young adults to gain experience with money. Receiving an allowance as a child (younger than age 12) also produced a high correlation at  $\beta = .90$ , further highlighting the importance of money experience. Explicit financial socialization from parents is necessary as well, as conversations about saving, investing, and using credit can help guide children toward better financial behaviors (Cho et al., 2012). The alternative split model of financial socialization shows both parental financial socialization and formal financial education have similar levels of influence on financial behavior ( $\beta = .03$  for each). At this time, there are few, if any studies exploring the effect of parental financial socialization on participation in financial education. The findings in the split model of financial socialization suggest that parental financial socialization has a strong, positive association with children enrolling in formal financial education. Given that other studies have found a positive relationship between financial education and financial behaviors (Kaiser & Menkhoff, 2017), this finding further emphasizes the importance of parents socializing their children regarding financial matters.

Furthermore, there is a positive, indirect relationship between financial socialization and financial behavior through financial self-efficacy. Financial socialization influences self-efficacy, and self-efficacy, in turn, influences financial behavior. As parents model good financial

behaviors, discuss financial topics with their children, and provide their children with opportunities to make their own financial decisions, this instills higher efficacy beliefs in the child regarding his or her own abilities to perform positive financial behaviors. Since financial self-efficacy is a key factor in implementing positive financial behaviors, this underscores the need for parents to engage in financial socialization activities.

## **Financial Knowledge**

### **Financial Knowledge and Financial Self-Efficacy**

The results of the model show that objective financial knowledge has no significant relationship with financial self-efficacy. This could be due to how objective financial knowledge was measured, as this is one limitation of the study. Heckman and Grable (2011) found objective financial knowledge to increase financial self-efficacy when using a more thorough measurement of objective financial knowledge that consisted of a 20-item personal finance quiz. Yet, Serido and associates (2013) found objective financial knowledge (measured with 15 true/false questions) was not an important predictor of financial self-efficacy. However, Serido and colleagues found subjective financial knowledge to have a positive and significant influence on financial self-efficacy. In Kazdin's (1978) review of Bandura's (1977) self-efficacy theory, he noted that self-efficacy depends on a level of competence, or at the very least perceived competence, regarding the behavior. Given that limited research has been conducted as to the antecedents of financial self-efficacy, both objective and subjective knowledge could be equally important. More research is needed to determine how objective and subjective financial knowledge influence financial self-efficacy.



## **Financial Knowledge and Financial Behavior**

Considering the numerous studies that have found a strong relationship between financial knowledge and behavior (Angrisan et al., 2016; Chatterjee et al., 2017; de Bassa Scheresberg, 2013; Henager & Cude, 2016; Nghia & Scott, 2018; Xiao et al., 2014), it was surprising to find no significant relationship between objective financial knowledge and financial behavior in the model. The most likely explanation for this non-association is the measurement for objective financial knowledge is fallacious. The construct for objective financial knowledge contained 4 multiple-choice items, covering inflation, interest rate, loan repayment, and take-home pay. Two items – interest rate and loan repayment – are essentially the same concept, with the loan repayment question requiring a little more extrapolation of general interest rate knowledge. A more thorough measurement of objective financial knowledge may yield different results.

## **Financial Self-Efficacy**

### **Financial Self-Efficacy and Financial Behavior**

The direct, positive relationship between financial self-efficacy and financial behavior in the model was congruent with previous findings (Asededo et al., 2018; Asebedo & Browning, 2017; Farrell et al., 2016; Lapp, 2010; Lown et al., 2015; Montford & Goldsmith, 2016). As predicated by Bandura (1977) and considered in the FFS conceptual model, the greater one's self-efficacy, the more likely the person will attempt a behavior. The magnitude of this relationship indicates financial self-efficacy is a major factor in performance of positive financial behaviors. Results of this study show that increasing financial self-efficacy can be achieved through financial socialization. Both parental financial socialization and formal financial education are predictors of financial self-efficacy; however, parental financial socialization has a much stronger influence on financial self-efficacy. Bandura (1977) indicated that self-efficacy

can be increased through successful attempts at a behavior. As experience with money had the strongest correlation with financial socialization, parents should find ways to provide their child with practice managing their own money, most commonly provided through the child earning an allowance or working part-time.

### **Family Financial Socialization Conceptual Model**

Overall, results of this study provide support for many of the propositions presented in Gudmunson and Dane's Family Financial Socialization (FFS) conceptual model. Differences were found in age, race, gender, and GPA with regards to receipt of financial socialization; however, other personal and family characteristics, such as income and parent's education level were not related to financial socialization. This study only focused on personal and family characteristics as control variables, and not predictors of financial socialization, so more exploration in this area is needed. An association between financial socialization and objective financial knowledge was supported by the findings. However, the results of the split model of financial socialization suggested there is an interaction effect between parent financial socialization and formal financial education that may need to be further explored in the FFS framework. Financial socialization was found to influence financial self-efficacy, which the FFS framework included as a motivating factor of capabilities. While the present study did not find an association between objective financial knowledge and financial self-efficacy, a different measurement of objective financial knowledge may yield different results. The relationship between financial attitudes, knowledge, and capabilities, as well as self-efficacy, should be examined in more detail to determine how financial socialization influences these constructs individually, as well as how their direct and indirect relationships may influence financial behavior and financial well-being, as posited in the FFS framework.

## **Contributions**

This study makes three meaningful contributions to the literature. First, it tests the Family Financial Socialization conceptual framework developed by Gudmunson and Danes (2011). A conceptual framework is the first step in theory development. As a conceptual model is tested over time, its propositions can be justified, and with consistent results, eventually develop into a mature theory (Danes & Yang, 2014). Research in the field of personal finance often borrows theory from other disciplines. By testing the FFS conceptual model, this study contributes to the justification of the framework, and offers support toward theory development in our discipline.

Second, results of this study provide new insight into the relationship between parental socialization and financial education. The strong, positive association between parental financial socialization and financial education indicates that children whose parents teach them about finances are significantly more likely to take a personal finance class or workshop. With the push to educate more people on personal finance topics, this provides a fresh observation into what factors might influence a person's decision to enroll in financial education. While one might consider parental financial socialization adequate, the results of this study indicate there may be an interaction effect between parental financial socialization and financial education that leads to greater financial knowledge. As noted in the discussion section, when financial socialization was tested as one combined construct that included facets for both parental financial socialization and financial education, financial socialization was a significant predictor of financial knowledge. However, in the split model of financial socialization, neither parental socialization nor financial education were significant predictors of financial knowledge.

Third, this study adds to existing literature by exploring the direct and indirect relationships between financial socialization, financial knowledge, financial self-efficacy, and

financial behavior in college students, using both Structural Equation Modeling and a large, national dataset. While other studies have explored these relationships directly, few have explored the indirect effects of financial socialization on self-efficacy through its association with financial knowledge. Of equal importance, many studies that involve college students are limited to samples from one or two institutions, making it difficult to generalize the results to college students throughout the United States. The present study uses data collected by The Ohio State University from 52 institutions, including two-year public, four-year public, and four-year private schools. The large number of institutions and participants allows for less bias in the results and a broader interpretation of the results.

### **Implications**

Findings from this study show strong support for the importance of financial socialization of children and young adults. Both parental financial socialization and financial education are equally important in the development of healthy financial behaviors. With the unique finding of this study showing parental financial socialization to be an important predictor of young adults participating in formal financial education while in high school or in college, it magnifies the importance of parents teaching and role modeling positive financial behaviors to their children. Results of this study indicate there may be an interaction effect between parental financial socialization and financial education that produces a significant increase in financial knowledge. Parents should be aware of the financial behaviors they are modeling in front of their children, and take time to engage in every day conversations pertaining to finances. Providing opportunities for children to earn an allowance or work a part-time job in high school can provide children with valuable money experience in a low-stakes environment, before they start living on their own in college. Successful experiences managing their own spending money can

lead to great financial self-efficacy and improved financial behavior in college. Discussing the importance of saving, investing, and budgeting, are also critical to a child's development of financial self-efficacy, as well as their future financial behaviors.

With only 57% of Americans being financially literate (Klapper, Lusardi, & van Oudheusden, 2015), parents may need community support to learn good financial practices for themselves, as well as how to instill positive financial behaviors in their children. Financial institutions, such as banks and credit unions, could present workshops for families and children to learn about budgeting, saving, and investing, as well as responsible use of credit and ways to improve credit scores. Research and extension offices may also want to be involved in developing personal financial education programs for the community. Resources and training materials should be created and made available for interested parties to easily access for use in workshops and classrooms.

Currently only five states (i.e., Alabama, Missouri, Tennessee, Utah, and Virginia) require high school students to participate in at least a half of a year of personal finance education (Carrns, 2018). With financial education shown to improve financial knowledge (Lapp, 2010; Shim et al., 2010) and financial behavior (Kaiser & Menkhoff, 2017), policy makers should push to mandate financial education for all students. The findings in the split financial socialization model of this study suggest a co-financial socialization approach may strengthen financial knowledge in young adults. Educators in K-12 may find it useful to inform parents about the financial curriculum taught in the classroom, in order for the parents to engage in conversations and experiences at home that coincide with school lessons. By working together, parents and educators can provide children with the necessary knowledge they need to

perform positive financial behaviors, as well as instill a level of self-efficacy in young adults that they are capable of handling financial matters properly.

Financial counselors, advisors, and therapists have the opportunity to encourage their clients with children of all ages to provide opportunities for their children to manage an allowance or earnings from a job, and to engage in regular discussions about savings, budgeting, investing, and appropriate use of credit with their children. Financial advisors may find that having a family financial education day with their clients will provide them opportunities to teach all members of the family about personal finance, as well as establish relationships with their clients' young adult children that could carry on into the future. Financial therapists can discuss ways that parents can interact with their children to establish healthy financial behaviors at a young age, and avoid troubling family financial patterns that have been established by previous generations.

Outcomes from this study suggest the FFS conceptual framework may be enhanced by further exploration of the direct and indirect relationships of financial attitudes, knowledge, and capabilities, and concepts, such as self-efficacy, that are included in this category. Understanding how these concepts interact can provide a clearer understanding of how we can improve upon and develop the necessary attitudes, skills, and capabilities that lead to better financial behavior. While the FFS conceptual model breaks apart the financial socialization construct into implicit and explicit financial socialization, this study examined financial socialization as whole, and as a split construct, examining parental financial socialization and formal financial education separately. The outcome from splitting financial socialization into these two constructs indicated there are differences in how parental financial socialization and formal financial education influence objective financial knowledge, as well as how parental financial socialization is

associated with the decision to enroll in formal financial education. The FFS conceptual model may benefit from further exploration into how these two types of financial socialization interact.

### **Strengths and Limitations**

As with all research, this study faced some limitations. Of primary concern, the measurement used for objective financial knowledge was mediocre. Consisting of four multiple-choice items, it was limited in the personal finance topics it tested. A more thorough measurement for objective financial knowledge may have yielded different results, as there were some unexpected relationships found in the model, or lack thereof, with objective financial knowledge. Another concern was the lack of a subjective financial knowledge measurement in the data. Subjective financial knowledge has been found to have associations with financial self-efficacy (Lapp, 2010; Serido et al., 2013) and financial behavior (Serido et al.), and the lack of this variable in the model provides us with limited results.

With the use of SEM, there are some constraints as well. Income had to be measured as a continuous variable in order for the model to converge in Mplus. Separating income into categories would have provided more detail into differences between respondents of different income levels, and may have provided different results. Similarly, parents' education level had to be measured as a continuous variable in order for the model to converge in Mplus, which provided less detail than a categorical measurement on differences in financial socialization based on parent education level. Use of latent constructs also limits interpretation of results to the constructs themselves, without much detail as to how the individual indicators influence one another. Interpretation of how specific financial socialization activities influence other variables can only be inferred from indicator correlations as to their importance in the financial socialization construct.

While SEM does limit some types of interpretation, it does allow for examination of the direct and indirect effects among the variables. By examining indirect relationships, we gain more knowledge into how and why variables influence one another. This study shows financial socialization to have a direct influence on financial behavior, as well as an indirect influence through its association with financial self-efficacy. This indirect relationship heightens financial self-efficacy's relevance to financial behavior. Finally, a major strength of this study is its use of a large, national dataset. By analyzing a larger and more diverse sample of college students, we can generalize our findings to a larger population. While the data set is not nationally representative, it does include students from 52 college institutions throughout the United States, as well as students enrolled at different types of college institutions (two-year public, four-year public, and four-year private). Most studies are limited to one or two institutions, which restricts their application to only students in that particular region or institution type. The results of this study are generalizable to college students with similar demographics as the sample, but is not limited to a specific institution or region.

### **Future Research**

While this study provides some unique findings, more research is needed to determine the exact nature of some relationships. Specifically, the association between parental financial socialization and financial education should be explored more to determine how parental financial socialization influences participation in formal financial education, as well as how parental financial socialization and formal financial education interact to influence financial knowledge and behavior. Future studies should examine how subjective financial knowledge fits into the FFS conceptual framework, as well as test the relationship between objective financial knowledge and self-efficacy using a different measure for objective financial knowledge. With



the strong association found between financial self-efficacy and positive financial behaviors, subsequent research should focus on the antecedents of financial self-efficacy. The present study focuses solely on the impact of financial socialization in college students. A longitudinal research study would provide greater discernment into the long-term impact of financial socialization on financial behaviors, beyond just the college years. Finally, it is important to investigate the disparity in financial socialization between genders and races. With financial socialization shown to have a strong influence on financial knowledge, self-efficacy, and behavior, it is essential that people of all races and genders have equal opportunities to learn about personal finance topics.

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## Appendix A - Supplemental Tables and Figures

**Table A.1 Correlation Matrix for All Variables**

| Variables              | 1       | 2       | 3       | 4       | 5       | 6       | 7       |
|------------------------|---------|---------|---------|---------|---------|---------|---------|
| 1. Spend More          | -       | .18***  | -.01    | .06***  | .16***  | .18***  | .05***  |
| 2. Purchase Want       | .18***  | -       | .16***  | .15***  | 0       | -.01    | .10***  |
| 3. Budget              | -.01    | .16***  | -       | .61***  | .10***  | .10***  | .37***  |
| 4. Spending            | .06***  | .15***  | .61***  | -       | .16***  | .13***  | .53***  |
| 5. Bills               | .16***  | 0       | .10***  | .16***  | -       | .28***  | .18***  |
| 6. Savings             | .18***  | -.01    | .10***  | .13***  | .28***  | -       | .13***  |
| 7. Checks              | .05***  | .10***  | .37***  | .53***  | .18***  | .13***  | -       |
| 8. Comfortable Talking | .14***  | -.04*** | -.02*   | .03**   | .14***  | .15***  | .05***  |
| 9. Taught Money Mgmt.  | .13***  | -.03**  | 0.02    | .07***  | .15***  | .16***  | .08***  |
| 10. Role Model         | .14***  | -.04*** | -.03**  | 0.01    | .16***  | .17***  | .03**   |
| 11. Child Allow        | 0       | -.04*** | 0       | -.01    | 0.02    | .04***  | -.02*   |
| 12. Teen Allow         | -.04*** | -.06*** | 0.02    | -.01    | -.01    | .03**   | -.01    |
| 13. HS Work            | -.02*   | -.02*   | .07***  | .03*    | .03*    | .03**   | 0.01    |
| 14. Save               | .11***  | -.05*** | -.04*** | .02*    | .11***  | .15***  | 0.02    |
| 15. Bank               | .08***  | -.06*** | -.03**  | 0.01    | .12***  | .12***  | 0.01    |
| 16. Invest             | 0.02    | -.04*** | .03**   | .03**   | .05***  | .15***  | .02*    |
| 17. HS Fin Ed          | .06***  | -.01    | -.02*   | 0.01    | .05***  | .08***  | 0.01    |
| 18. Coll Fin Ed        | -.01    | 0.01    | .05***  | .03*    | .02*    | .05***  | .02*    |
| 19. Confident          | .15***  | .08***  | .21***  | .23***  | .26***  | .26***  | .20***  |
| 20. Manage Money Well  | .24***  | .16***  | .24***  | .29***  | .27***  | .31***  | .23***  |
| 21. FKQ 1              | .04***  | .02*    | -.02    | 0.01    | .06***  | 0.02    | -.01    |
| 22. FKQ 2              | .04***  | 0.01    | -0.01   | 0.01    | .05***  | 0.02    | 0       |
| 23. FKQ 3              | .02*    | .03**   | .04***  | .03***  | .06***  | .02*    | 0.01    |
| 24. FKQ 4              | 0       | 0.01    | .04***  | 0.02    | .02*    | 0.01    | 0.01    |
| 25. Income             | -.14*** | 0.01    | .17***  | .07***  | -.01    | .09***  | .03**   |
| 26. Parent Income      | .09***  | -.11*** | -.07*** | -.07*** | .11***  | .11***  | -.06*** |
| 27. Race               | -.05*** | 0       | .02*    | .02*    | -.04*** | -.04*** | .02*    |
| 28. Gender             | 0.02    | 0       | 0       | -.01    | 0.01    | 0       | 0.01    |
| 29. Years Enrolled     | -.03*** | 0.01    | .03**   | 0       | 0       | -.02*   | -.02    |
| 30. GPA                | .11***  | 0.01    | -.02*   | 0.01    | .13***  | .12***  | 0.01    |
| 31. Age                | -.05*** | 0.01    | .05***  | .02*    | -.03**  | -.04*** | 0.01    |
| 32. Parent Ed.         | .11***  | -.06*** | -.09*** | -.07*** | .07***  | .09***  | -.05*** |
| 33. Institution Type   | -.05*** | .07***  | .09***  | .05***  | -.10*** | -.02    | .04***  |

| Variables              | 8       | 9       | 10      | 11      | 12      | 13      | 14      |
|------------------------|---------|---------|---------|---------|---------|---------|---------|
| 8. Comfortable Talking | -       | .72***  | .57***  | .11***  | .10***  | -.01    | .37***  |
| 9. Taught Money Mgmt.  | .72***  | -       | .68***  | .13***  | .12***  | -.01    | .44***  |
| 10. Role Model         | .57***  | .68***  | -       | .14***  | .15***  | -.01    | .43***  |
| 11. Child Allow        | .11***  | .13***  | .14***  | -       | .54***  | .03**   | .13***  |
| 12. Teen Allow         | .10***  | .12***  | .15***  | .54***  | -       | -.05*** | .11***  |
| 13. HS Work            | -.01    | -.01    | -.01    | .03**   | -.05*** | -       | .04***  |
| 14. Save               | .37***  | .44***  | .43***  | .13***  | .11***  | .04***  | -       |
| 15. Bank               | .31***  | .034*** | .32***  | .11***  | .08***  | .11***  | .50***  |
| 16. Invest             | .23***  | .28***  | .28***  | .09***  | .09***  | .01     | .22***  |
| 17. HS Fin Ed          | .09***  | .12***  | .09***  | .02*    | -.01    | .05***  | .09***  |
| 18. Coll Fin Ed        | 0.01    | 0.01    | 0.01    | .03*    | .02*    | .03**   | 0       |
| 19. Confident          | .15***  | .17***  | .10***  | 0.01    | 0       | .06***  | .04***  |
| 20. Manage Money Well  | .16***  | .20***  | .15***  | 0.02    | -.01    | .02*    | .09***  |
| 21. FKQ 1              | -.02    | -.02**  | 0       | .03**   | 0.01    | .03***  | -.02*   |
| 22. FKQ 2              | 0.01    | -.01    | .02*    | 0.01    | .02*    | .03**   | 0.01    |
| 23. FKQ 3              | -.02*   | -.04*** | -.02*   | 0       | 0       | .07***  | -.02*   |
| 24. FKQ 4              | -.02*   | -.02    | 0       | 0.01    | .02*    | .07***  | -.02*   |
| 25. Income             | -.15*** | -.18*** | -.17*** | .02*    | 0.01    | .18***  | -.17*** |
| 26. Parent Income      | .19***  | .23***  | .36***  | .15***  | .12***  | .06***  | .19***  |
| 27. Race               | -.02*   | -.02**  | -.04*** | -.03*** | .02*    | -.12*** | -.01    |
| 28. Gender             | 0.02    | 0       | 0.01    | -.01    | -.02    | 0       | 0       |
| 29. Years Enrolled     | -.03**  | -.04*** | -.03**  | .02*    | 0       | .03**   | -.03**  |
| 30. GPA                | .06***  | .06***  | .10***  | .04***  | 0.01    | -.01    | .05***  |
| 31. Age                | -.07*** | -.07*** | -.06*** | 0       | 0       | .04***  | -.05*** |
| 32. Parent Ed.         | .18***  | .20***  | .27***  | .11***  | .08***  | -.01    | .18***  |
| 33. Institution Type   | -.08*** | -.08*** | -.09*** | 0       | .03**   | 0.01    | -.09*** |

| Variables             | 15      | 16     | 17      | 18     | 19     | 20     | 21     |
|-----------------------|---------|--------|---------|--------|--------|--------|--------|
| 15. Bank              | -       | .19*** | .09***  | 0      | .05*** | .08*** | -.01   |
| 16. Invest            | .19***  | -      | .06***  | .05*** | .10*** | .12*** | 0      |
| 17. HS Fin Ed         | .09***  | .06*** | -       | .16*** | .05*** | .06*** | .04*** |
| 18. Coll Fin Ed       | 0       | .05*** | .16***  | -      | .08*** | .05*** | .07*** |
| 19. Confident         | .05***  | .10*** | .05***  | .08*** | -      | .64*** | .08*** |
| 20. Manage Money Well | .08***  | .12*** | .06***  | .05*** | .64*** | -      | .04*** |
| 21. FKQ 1             | -.01    | 0      | .04***  | .07*** | .08*** | .04*** | -      |
| 22. FKQ 2             | .02*    | 0      | .02*    | .06*** | .08*** | .06*** | .32*** |
| 23. FKQ 3             | 0.01    | -.03** | .03**   | .05*** | .10*** | .06*** | .28*** |
| 24. FKQ 4             | 0       | .02*   | -.03**  | .03**  | .05*** | .03**  | .18*** |
| 25. Income            | -.10*** | -.03** | -.06*** | .08*** | .17*** | .05*** | .10*** |
| 26. Parent Income     | .21***  | .17*** | .04**   | 0      | 0.02   | .04*** | .06*** |

|                      |         |        |         |        |         |         |         |
|----------------------|---------|--------|---------|--------|---------|---------|---------|
| 27. Race             | -.05*** | 0.01   | -.06*** | 0      | -.04*** | -.04*** | -.03*** |
| 28. Gender           | 0       | -.01   | -.01    | -.02*  | -.01    | 0.1     | -.02    |
| 29. Years Enrolled   | 0.01    | -.02*  | -.02*   | .03**  | -.01    | -.02*   | .04***  |
| 30. GPA              | .04***  | .02*   | .02*    | 0      | .08***  | .12***  | .09***  |
| 31. Age              | -.06*** | -.03** | -.01    | .03**  | 0.02    | -.01    | .02**   |
| 32. Parent Ed.       | .19***  | .13*** | .05***  | 0.01   | -.03**  | 0.01    | .06***  |
| 33. Institution Type | -.08*** | -.01   | -.07*** | -.03** | .03**   | 0       | -.04*** |

| Variables            | 22     | 23      | 24      | 25      | 26      | 27      | 28      |
|----------------------|--------|---------|---------|---------|---------|---------|---------|
| 22. FKQ 2            | -      | .37***  | .16***  | .10***  | .06***  | -.02    | -.02*   |
| 23. FKQ 3            | .37*** | -       | .18***  | .14***  | .05***  | -.05*** | -.01    |
| 24. FKQ 4            | .16*** | .18***  | -       | .12***  | .06***  | -.05*** | -.04*** |
| 25. Income           | .10*** | .14***  | .12***  | -       | -.04**  | -.09*** | -.01    |
| 26. Parent Income    | .06*** | .05***  | .06***  | -.04**  | -       | -.11*** | 0.01    |
| 27. Race             | -.02   | -.05*** | -.05*** | -.09*** | -.11*** | -       | -.01    |
| 28. Gender           | -.02*  | -.01    | -.04*** | -.01    | 0.01    | -.01    | -       |
| 29. Years Enrolled   | .04*** | .05***  | .02*    | .13***  | 0.02    | -.02    | -.02    |
| 30. GPA              | .06*** | .06***  | .03**   | -.04*** | .08***  | -.04*** | 0.01    |
| 31. Age              | .02*   | .04***  | .04***  | .16***  | -.03*   | -.03**  | -.01    |
| 32. Parent Ed.       | .05*** | 0.01    | 0.01    | -.16*** | .45***  | -.04*** | 0       |
| 33. Institution Type | -.02*  | -.01    | .03**   | .13***  | -.13*** | -.01    | 0.01    |

| Variables            | 29      | 30     | 31      | 32      | 33      |
|----------------------|---------|--------|---------|---------|---------|
| 29. Years Enrolled   | -       | -.03** | .03**   | -.01    | -.05*** |
| 30. GPA              | -.03**  | -      | -.02    | .09***  | 0.01    |
| 31. Age              | .03**   | -.02   | -       | -.07*** | .05***  |
| 32. Parent Ed.       | -.01    | .09*** | -.07*** | -       | -.15*** |
| 33. Institution Type | -.05*** | 0.01   | .05***  | -.15*** | -       |

**Table A.2 Split Socialization Model Direct Effects with Financial Behavior (*N* = 12,598)\***

| Parameter                                  | Unstandardized |      | Standardized |      |         |
|--|----------------|------|--------------|------|---------|
|  | b              | SE   | $\beta$      | SE   | p       |
| Financial Self-Efficacy→Fin. Behavior      | 1.407          | 0.02 | 0.812        | 0.00 | 0.00*** |
| Financial Knowledge→Fin. Behavior          | 0.034          | 0.03 | 0.019        | 0.02 | 0.18    |
| Financial Socialization→Fin. Behavior      | 0.051          | 0.01 | 0.029        | 0.01 | .00***  |
| Financial Education→Fin. Behavior          | 0.046          | 0.01 | 0.031        | 0.01 | 0.00*** |
| Financial Self-Efficacy→Fin. Knowledge     | -.002          | 0.01 | -.002        | 0.01 | 0.88    |
| Financial Self-Efficacy→Fin. Socialization | 0.131          | 0.00 | 0.131        | 0.00 | 0.00*** |
| Financial Self-Efficacy→Fin. Education     | 0.022          | 0.00 | 0.025        | 0.00 | .00***  |
| Financial Knowledge→Fin. Socialization     | -.001          | 0.02 | -.001        | 0.02 | 0.94    |
| Financial Knowledge→Fin. Education         | 0.031          | 0.02 | 0.037        | 0.02 | 0.10    |
| Financial Socialization→Fin. Education     | 0.610          | 0.01 | 0.525        | 0.01 | 0.00*** |
| Female→Financial Socialization             | -.001          | 0.03 | 0.000        | 0.01 | 0.98    |
| Black→Financial Socialization              | -.76           | 0.05 | -.058        | 0.01 | 0.00*** |
| Asian→Financial Socialization              | -.212          | 0.05 | -.047        | 0.01 | 0.00*** |
| Hispanic→Financial Socialization           | -.151          | 0.05 | -.034        | 0.01 | 0.00**  |
| Mixed Race→Financial Socialization         | -.057          | 0.05 | -.015        | 0.01 | 0.24    |
| Other Race→Financial Socialization         | -.385          | 0.07 | -.047        | 0.01 | .00***  |
| Income→Financial Socialization             | 0.000          | 0.00 | 0.011        | 0.01 | 0.44    |
| Parent Education→Financial Socialization   | 0.011          | 0.10 | 0.002        | 0.02 | 0.91    |
| Four-Year Private→Fin. Socialization       | -.020          | 0.04 | -.006        | 0.01 | 0.64    |
| Two-Year Public→Fin. Socialization         | -.005          | 0.05 | -.001        | 0.01 | 0.91    |
| Age→Financial Socialization                | -.013          | 0.00 | -.096        | 0.01 | .00***  |
| GPA→Financial Socialization                | 0.067          | 0.03 | 0.035        | 0.01 | 0.01**  |
| First Year Students→Fin. Socialization     | -.068          | 0.03 | -.026        | 0.01 | .03*    |
| Female→Financial Education                 | -.105          | 0.04 | -.042        | 0.02 | 0.01**  |
| Black→Financial Education                  | 0.053          | 0.06 | 0.010        | 0.01 | 0.36    |
| Asian→Financial Education                  | 0.078          | 0.08 | 0.015        | 0.01 | 0.30    |
| Hispanic→Financial Education               | 0.077          | 0.06 | 0.015        | 0.01 | 0.19    |
| Mixed Race→Financial Education             | 0.081          | 0.07 | 0.019        | 0.02 | 0.23    |
| Other Race→Financial Education             | 0.137          | 0.13 | 0.014        | 0.01 | 0.30    |
| Income→Financial Education                 | 0.000          | 0.00 | 0.008        | 0.01 | 0.51    |
| Parent Education→Financial Education       | 0.015          | 0.12 | 0.002        | 0.02 | 0.90    |
| Four-Year Private→Financial Education      | -.030          | 0.06 | -.007        | 0.01 | 0.59    |
| Two-Year Public→Financial Education        | -.046          | 0.06 | -.011        | 0.01 | 0.40    |
| Age→Financial Education                    | 0.005          | 0.00 | 0.031        | 0.01 | 0.01**  |
| GPA→Financial Education                    | -.002          | 0.03 | -.001        | 0.01 | 0.95    |
| First Year Students→Financial Education    | 0.008          | 0.04 | 0.003        | 0.01 | 0.84    |

|           |     |
|-----------|-----|
| R-Squared | .67 |
|-----------|-----|

*\*Note: \*p < .05, \*\*p < .01, \*\*\*p < .001 All results were computed with Mplus in delta parameterization and STDYX standardization.*

Overall Model Fit Indices:  $\chi^2(226) = 5,917.36, p = <.001$ ; RMSEA = .045, 90% CI [.044, .046], CFI = .86, TLI = .83.

Reference Groups: male, White, four-year public, students enrolled two or more years

**Table A.3 Split Socialization Model Indirect Effects (N = 12,598)\***

| Parameter   | Unstandardized |      | Standardized |      |
|---|----------------|------|--------------|------|
|   | b              | SE   | $\beta$      | SE   |
| Parent Financial Socialization→Financial Self-Efficacy→Financial Behavior                     | 0.185***       | 0.01 | 0.117***     | 0.00 |
| Parent Financial Socialization→Financial Education→Financial Self-Efficacy→Financial Behavior | .019***        | 0.00 | .011***      | 0.00 |
| Parent Financial Socialization→Financial Education→Financial Self-Efficacy                    | .031***        | 0.01 | .021***      | 0.00 |
| Financial Education→Financial Self-Efficacy→Financial Behavior                                | .013***        | 0.00 | .013***      | 0.00 |

*\*Note: \*p < .05, \*\*p < .01, \*\*\*p < .001 All results were computed with Mplus in delta parameterization and STDYX standardization.*

**Table A.4 Direct Effects with Financial Behavior without First Year Students (N = 10,302)\***

| Parameter                              | Unstandardized |      | Standardized |      |        |
|--|----------------|------|--------------|------|--------|
|  | b              | SE   | $\beta$      | SE   | p      |
| Financial Self-Efficacy→Fin. Behavior  | 2.191          | 0.04 | 0.907        | 0.00 | .00*** |
| Financial Knowledge→Fin. Behavior      | 0.058          | 0.04 | 0.024        | 0.02 | 0.16   |
| Financial Socialization→Fin. Behavior  | 0.075          | 0.01 | 0.031        | 0.00 | .00*** |
| Financial Self-Efficacy→Fin. Knowledge | -.008          | 0.02 | -.008        | 0.02 | 0.59   |
| Fin. Self-Efficacy→Fin. Socialization  | 0.201          | 0.00 | 0.200        | 0.00 | .00*** |
| Financial Knowledge→Fin. Socialization | 0.025          | 0.01 | 0.025        | 0.01 | .03**  |
| Female→Financial Socialization         | -.028          | 0.03 | -0.013       | 0.02 | 0.4    |
| Black→Financial Socialization          | -.349          | 0.05 | -0.073       | 0.01 | .00*** |
| Asian→Financial Socialization          | -.132          | 0.06 | -0.029       | 0.01 | .03**  |
| Hispanic→Financial Socialization       | -.144          | 0.06 | -0.032       | 0.01 | .02**  |
| Mixed Race→Financial Socialization     | -.042          | 0.06 | -0.011       | 0.02 | 0.49   |
| Other Race→Financial Socialization     | -.476          | 0.06 | -0.060       | 0.01 | .00*** |
| Income→Financial Socialization         | 0.001          | 0.00 | 0.022        | 0.01 | 0.11   |
| Parent Education→Fin. Socialization    | -.024          | 0.09 | -.004        | 0.01 | 0.78   |
| Four-Year Private→Fin. Socialization   | -.023          | 0.04 | -0.007       | 0.01 | 0.60   |
| Two-Year Public→Fin. Socialization     | -.046          | 0.05 | -0.012       | 0.01 | 0.34   |
| Age→Financial Socialization            | -.012          | 0.00 | -.088        | 0.01 | .00*** |
| GPA→Financial Socialization            | 0.075          | 0.03 | 0.037        | 0.01 | .01**  |
| R-Squared                              | .84            |      |              |      |        |

\*Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$  All results were computed with Mplus in delta parameterization and STDYX standardization. Overall Model Fit Indices:  $\chi^2(204) = 4,234.14$ ,  $p = <.001$ ; RMSEA = .044, 90% CI [.043, .045], CFI = .86, TLI = .84.

Reference Groups: male, White, four-year public, students enrolled two or more years

**Table A.5 Direct Effect with Financial Behavior for Do Not Know Income (N = 12,598)\***

| Parameter                                       | Unstandardized |      | Standardized |      |        |
|---|----------------|------|--------------|------|--------|
|   | b              | SE   | $\beta$      | SE   | p      |
| Financial Self-Efficacy→Financial Behavior      | 2.038          | 0.03 | 0.897        | 0.00 | .00*** |
| Financial Knowledge→Financial Behavior          | 0.050          | 0.04 | 0.022        | 0.02 | 0.23   |
| Financial Socialization→Financial Behavior      | 0.042          | 0.01 | 0.018        | 0.01 | .00*** |
| Financial Self-Efficacy→Financial Knowledge     | -.002          | 0.01 | -.002        | 0.01 | 0.87   |
| Financial Self-Efficacy→Financial Socialization | 0.166          | 0.00 | 0.165        | 0.00 | .00*** |
| Financial Knowledge→Financial Socialization     | 0.030          | 0.01 | 0.030        | 0.01 | .00**  |
| Female→Financial Socialization                  | -.040          | 0.03 | -.018        | 0.01 | 0.17   |
| Black→Financial Socialization                   | -.267          | 0.04 | -.056        | 0.01 | .00*** |
| Asian→Financial Socialization                   | -.201          | 0.05 | -.045        | 0.01 | .00*** |
| Hispanic→Financial Socialization                | -.150          | 0.06 | -.033        | 0.01 | .01**  |
| Mixed Race→Financial Socialization              | -.049          | 0.05 | -.013        | 0.01 | 0.32   |
| Other Race→Financial Socialization              | -.379          | 0.06 | -.046        | 0.01 | .00*** |
| Do Not Know Income→Financial Socialization      | -.151          | 0.05 | -.036        | 0.01 | 0.00** |
| Parent Education→Financial Socialization        | -.004          | 0.09 | -.001        | 0.01 | 0.96   |
| Four-Year Private→Financial Socialization       | -.032          | 0.04 | -0.009       | 0.01 | 0.41   |
| Two-Year Public→Financial Socialization         | -.019          | 0.04 | -0.005       | 0.01 | 0.66   |
| Age→Financial Socialization                     | -.011          | 0.00 | -.084        | 0.01 | .00*** |
| GPA→Financial Socialization                     | 0.082          | 0.03 | 0.043        | 0.01 | .00**  |
| First Year Students→Financial Socialization     | -.070          | 0.03 | -.027        | 0.01 | .02*   |
| R-Squared                                       | .81            |      |              |      |        |

\* Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$  All results were computed with Mplus in delta parameterization and STDYX standardization. Overall Model Fit Indices:  $\chi^2(216) = 4,616.87$ ,  $p = <.001$ ; RMSEA = .040, 90% CI [.039, .041], CFI = .87, TLI = .85.

Reference Groups: male, White, know income, four-year public, students enrolled two or more years

**Table A.6 Direct Effects with Financial Behavior for Prefer Not to Answer (N = 12,598)\***

| Parameter                                       | Unstandardized |      | Standardized |      |        |
|---|----------------|------|--------------|------|--------|
|   | b              | SE   | $\beta$      | SE   | p      |
| Financial Self-Efficacy→Financial Behavior      | 2.011          | 0.03 | 0.894        | 0.00 | .00*** |
| Financial Knowledge→Financial Behavior          | 0.050          | 0.03 | 0.022        | 0.02 | 0.14   |
| Financial Socialization→Financial Behavior      | 0.053          | 0.01 | 0.023        | 0.00 | .00*** |
| Financial Self-Efficacy→Financial Knowledge     | -.004          | 0.01 | -.004        | 0.01 | 0.78   |
| Financial Self-Efficacy→Financial Socialization | 0.164          | 0.00 | 0.164        | 0.00 | .00*** |
| Financial Knowledge→Financial Socialization     | 0.029          | 0.01 | 0.030        | 0.01 | .00*** |
| Female→Financial Socialization                  | -.043          | 0.03 | -0.020       | 0.01 | 0.12   |
| Black→Financial Socialization                   | -.274          | 0.05 | -0.058       | 0.01 | .00*** |
| Asian→Financial Socialization                   | -.206          | 0.05 | -0.046       | 0.01 | .00*** |
| Hispanic→Financial Socialization                | -.148          | 0.06 | -0.033       | 0.01 | .01**  |
| Mixed Race→Financial Socialization              | -.050          | 0.05 | -0.013       | 0.01 | 0.31   |
| Other Race→Financial Socialization              | -.398          | 0.07 | -0.049       | 0.01 | .00*** |
| Prefer Not to Answer Inc.→Fin. Socialization    | -.013          | 0.07 | -.003        | 0.02 | 0.86   |
| Parent Education→Financial Socialization        | -.011          | 0.08 | -.002        | 0.01 | 0.9    |
| Four-Year Private→Financial Socialization       | -.033          | 0.04 | -0.009       | 0.01 | 0.39   |
| Two-Year Public→Financial Socialization         | -.019          | 0.04 | -0.005       | 0.01 | 0.66   |
| Age→Financial Socialization                     | -.011          | 0.00 | -.085        | 0.01 | .00*** |
| GPA→Financial Socialization                     | 0.072          | 0.02 | 0.037        | 0.01 | .00**  |
| First Year Students→Financial Socialization     | -.073          | 0.03 | -.028        | 0.01 | .02*   |
| R-Squared                                       | .81            |      |              |      |        |

\* Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$  All results were computed with Mplus in delta parameterization and STDYX standardization. Overall Model Fit Indices:  $\chi^2(216) = 4,607.70$ ,  $p = <.001$ ; RMSEA = .040, 90% CI [.039, .041], CFI = .87, TLI = .85.

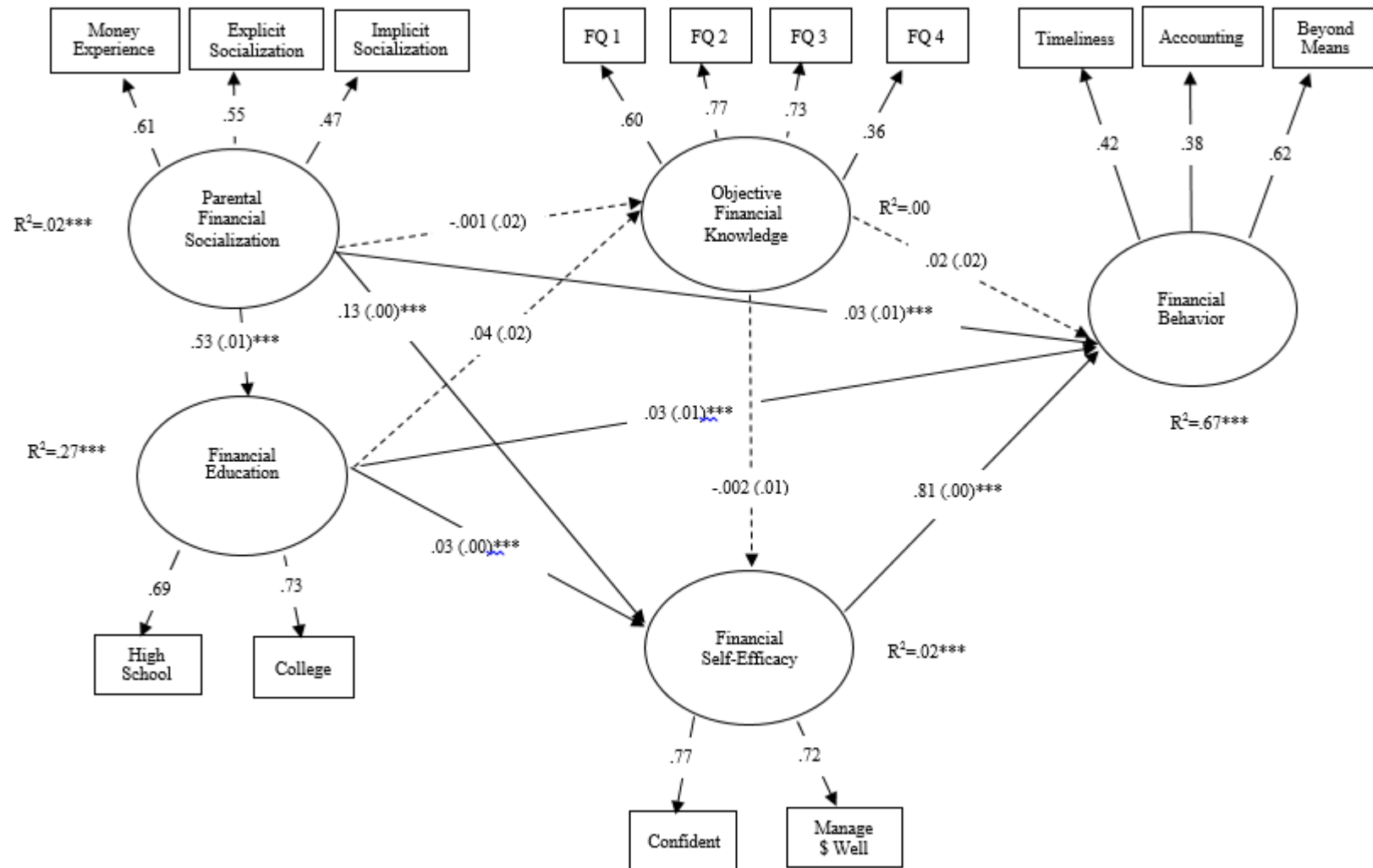
Reference Groups: male, White, answered income, four-year public, students enrolled two or more years



**Table A.7 Glossary**

| <b>Term</b>                      | <b>Definition</b>   | <b>Source</b>                               |
|----------------------------------|---|---|
| Economic self-efficacy           | Self-confidence pertaining to the economic domain   | Lee & Mortimer, 2009                        |
| Explicit financial socialization | Purposive efforts to teach, model, and practice financial knowledge and behaviors   | Danes & Yang, 2014; Gudmunson & Danes, 2011 |
| Financial behavior               | Human behavior related to money management  | Xiao, 2008                                  |
| Financial literacy               | A measure of how well an individual can understand and use personal finance related information                               | Huston, 2010                                |
| Financial self-efficacy          | Confidence in one's ability to manage personal finances   | Lim, Heckman, Letkiewicz, & Montalto, 2014  |
| Financial socialization          | The process by which children acquire and develop financial knowledge, skills, attitudes, and behaviors over time             | Danes & Yang, 2014; Gudmunson & Danes, 2011 |
| Implicit financial socialization | Occurs from children observing parent financial behaviors and daily interactions  | Danes & Yang, 2014; Gudmunson & Danes, 2011 |
| Objective financial knowledge    | A measure of what one actually knows about personal finance determined by correct responses to questions on financial topics. | Robb, Babiarz, Woodyard, & Seay, 2015       |
| Self-efficacy                    | One's confidence in their ability to produce a desired result. Considered to be domain specific.                              | Bandura, 1977                               |
| Subjective financial knowledge   | A measure of what one thinks they know about personal finance determined by self-assessment                                   | Robb, Babiarz, Woodyard, & Seay, 2015       |

**Figure A.1 Significant Pathways in Structural Model Predicting Financial Behavior with Split Socialization Construct ( $N = 12,598$ )\***



---

*\*Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Model Fit Indices:  $\chi^2(226) = 5,917.36$ ,  $p = <.001$ ; RMSEA = .045, 90% CI [.044, .046], CFI = .86, TLI = .83. All results were computed with Mplus in delta parameterization and STDYX standardization. The structural model was estimated with indicators from the measurement model for the latent variables and controls for gender, age, race, income, parent education, GPA, years enrolled in school, and institution type.*

## Appendix B - SAS and Mplus Code

### SAS Code

```
*Financial behaviors;

if spend_credit = 1 then spendmor = 4;
if spend_credit = 2 then spendmor = 3;
if spend_credit = 3 then spendmor = 2;
if spend_credit = 4 then spendmor = 1;
if spend_credit = -99 then spendmore_miss = 1; else spendmore_miss = 0;

if purchasewantvneed = 1 then want=4;
if purchasewantvneed = 2 then want=3;
if purchasewantvneed = 3 then want=2;
if purchasewantvneed = 4 then want=1;
if purchasewantvneed = -99 then want_miss = 1; else want_miss = 0;

if havebudget = 1 then budget = 1;
if havebudget = 2 then budget = 2;
if havebudget = 3 then budget = 3;
if havebudget = 4 then budget = 4;
if havebudget = -99 then budget_miss=1; else budget_miss =0;

if trackspending = 1 then spending =1;
if trackspending = 2 then spending = 2;
if trackspending = 3 then spending = 3;
if trackspending = 4 then spending = 4;
if trackspending =-99 then spending_miss=1; else spending_miss =0;

if paybills = 1 then bills = 1;
if paybills = 2 then bills = 2;
if paybills = 3 then bills = 3;
if paybills = 4 then bills = 4;
```

```

if paybills = -99 then bills_miss =1; else bills_miss = 0;

if addsavings = 1 then savings = 1;
if addsavings = 2 then savings = 2;
if addsavings = 3 then savings = 3;
if addsavings = 4 then savings =4;
if addsavings = -99 then savings_miss =1; else savings_miss =0;

if trackchecks = 1 then checks = 1;
if trackchecks = 2 then checks = 2;
if trackchecks = 3 then checks = 3;
if trackchecks =4 then checks = 4;
if trackchecks = -99 then checks_miss = 1; else checks_miss = 0;

finbehav= sum (budget + spending + checks + bills + savings + spendmor + want);

accting= (sum(budget + checks + spending)/3);
timely = (sum(bills + savings)/2);
beyond = (sum(want + spendmor)/2);

*Financial Socialization;

if parents_comfortable = 1 then pcomfort = 1;
if parents_comfortable = 2 then pcomfort = 2;
if parents_comfortable =3 then pcomfort = 3;
if parents_comfortable = 4 then pcomfort = 4;
if parents_comfortable = -99 then pcomfort_miss = 1; else pcomfort_miss = 0;
if parents_comfortable = . then delete;

if parents_moneymanagement = 1 then pmoneymg = 1;
if parents_moneymanagement =2 then pmoneymg = 2;
if parents_moneymanagement = 3 then pmoneymg = 3;
if parents_moneymanagement = 4 then pmoneymg = 4;
if parents_moneymanagement = -99 then pmoneymgt_miss = 1; else pmoneymgt_miss = 0;
if parents_moneymanagement = . then delete;

if parents_rolemodel = 1 then pmodel = 1;

```

```

if parents_rolemodel =2 then pmodel = 2;
if parents_rolemodel = 3 then pmodel = 3;
if parents_rolemodel = 4 then pmodel = 4;
if parents_rolemodel = -99 then pmodel_miss = 1; else pmodel_miss =0;
if parents_rolemodel = . then delete;

if precollege_allowancechild = 1 then childall = 0;
if precollege_allowancechild = 2 then childall = 1;
if precollege_allowancechild = -99 then childallow_miss = 1; else childallow_miss =0;
if precollege_allowancechild = . then delete;

if precollege_allowanceteen = 1 then teenall = 0;
if precollege_allowanceteen = 2 then teenall = 1;
if precollege_allowanceteen = -99 then teenallow_miss = 1; else teenallow_miss = 0;
if precollege_allowanceteen = . then delete;

if precollege_work = 1 then HSwork = 0;
if precollege_work = 2 then HSwork = 1;
if precollege_work = -99 then HSwork_miss = 1; else HSwork_miss=0;
if precollege_work = . then delete;

if precollege_save = 1 then save = 0;
if precollege_save = 2 then save = 1;
if precollege_save = -99 then save_miss = 1; else save_miss =0;
if precollege_save = . then delete;

if precollege_bankaccount = 1 then bank = 0;
if precollege_bankaccount = 2 then bank = 1;
if precollege_bankaccount = -99 then bank_miss = 1; else bank_miss = 0;
if precollege_bankaccount = . then delete;

if precollege_invest = 1 then invest = 0;
if precollege_invest = 2 then invest = 1;
if precollege_invest = -99 then invest_miss = 1; else invest_miss = 0;
if precollege_invest = . then delete;

```

```

if financeclass_highschool = 1 then HSfin = 1;
if financeclass_highschool = 2 then HSfin = 2;
if financeclass_highschool = 3 then HSfin = 3;
if financeclass_highschool = -99 then HSfin_miss = 1; else HSfin_miss = 0;
if financeclass_highschool = . then delete;

if financeclass_college = 1 then Collfin = 1;
if financeclass_college = 2 then Collfin = 2;
if financeclass_college = 3 then Collfin = 3;
if financeclass_college = -99 then Collfin_miss = 1; else Collfin_miss = 0;
if financeclass_college = . then delete;

impsoc = (sum (pcomfort + pmodel + pmoneymg)/3);
fined = (sum (HSfin + Collfin)/2);
expsoc = (sum(save + bank + invest)/3);
monexp = (sum (childall + teenall + HSwork)/3);
finsoc = (sum(pcomfort + pmodel + pmoneymg + HSfin + Collfin + save + bank + invest + childall + teenall +
HSwork)/11);

* Current annual income;

income=annualincome_self;
if income = 1 then noinc=1; else noinc=0;
if income = 2 then inc2500=1; else inc2500=0;
if income = 3 then inc5000=1; else inc5000=0;
if income = 4 then inc7500=1; else inc7500=0;
if income = 5 then inc10k=1; else inc10k=0;
if income = 6 then inc15k=1; else inc15k=0;
if income = 7 then inc20k=1; else inc20k=0;
if income = 8 then inc25k=1; else inc25k=0;
if income = 9 then inc30k=1; else inc30k=0;
if income = 10 then incGT30K=1; else incGT30K=0;

if income = . then delete;

*income as continuous;

if annualincome_self =1 then inc=1;

```

```

if annualincome_self = 2 then inc=2;
if annualincome_self = 3 then inc=3;
if annualincome_self=4 then inc=4;
if annualincome_self =5 then inc=5;
if annualincome_self =6 then inc=6;
if annualincome_self =7 then inc=7;
if annualincome_self =8 then inc=8;
if annualincome_self =9 then inc=9;
if annualincome_self = 10 then inc=10;
if annualincome_self = 11 then DKinc=1; else DKinc=0;
if annualincome_self in (-99, 12) then PNAinc=1; else PNAinc=0;
if annualincome_self = . then delete;
* Financial Self Efficacy;
if confidentfinances = 1 then confident =1;
if confidentfinances = 2 then confident = 2;
if confidentfinances = 3 then confident =3;
if confidentfinances = 4 then confident = 4;
if confidentfinances = -99 then confidentfinances_miss =1; else confidentfinances_miss=0;
if confidentfinances = . then delete;

if managemoneywell = 1 then mmwell = 1;
if managemoneywell = 2 then mmwell = 2;
if managemoneywell = 3 then mmwell = 3;
if managemoneywell = 4 then mmwell = 4;
if managemoneywell = -99 then managemoneywell_miss=1; else managemoneywell_miss=0;
if managemoneywell = . then delete;

FSE = (Sum(mmwell + confident)/2);

* financial knowledge;
if finknowledge_SCORE = . then delete;

fin1=finknowledge_1correct ;
fin2=finknowledge_2correct;
fin3=finknowledge_3correct;
fin4=finknowledge_4correct;
fin5=finknowledge_5correct;

```



```

finknow = (sum(fin1 + fin2 + fin3 +fin4)/4);

* GPA;
if gpa_recode = . then delete;

gpacat = gpa_recode;

* Age;
if age_category = . then delete;

agecat = age_category;

* Gender;

if gender = 1 then male = 1; else male = 0;
if gender = 2 then female =1; else female = 0;
if gender in (3,4,5) then delete;
if gender = . then delete;
if gender = -99 then gender_miss = 1; else gender_miss =0;

* Race;
if race = 1 then white=1; else white =0;
if race = 2 then black = 1; else black =0;
if race = 3 then hispanic = 1; else hispanic = 0;
if race = 4 then asian = 1; else asian = 0;
if race in (5,6,7,9) then other =1; else other = 0;
if race in (-99,10) then race_miss=1; else race_miss= 0;
if race = 8 then mixed=1; else mixed = 0;
if race = . then delete;

*parent education;
if education_mother = 1 then momLTHS=1; else momLTHS=0;
if education_mother = 2 then momHS = 1; else momHS=0;
if education_mother = 3 then momsocol=1; else momsocol =0;
if education_mother = 4 then momassoc = 1; else momassoc =0;
if education_mother = 5 then mombach=1; else mombach=0;

```

```

if education_mother = 6 then momgrad=1; else momgrad=0;
if education_mother in (7,8) then momprof=1; else momprof=0;
if education_mother = 9 then momDKed =1 ;else momDKed=0;
if education_mother in (., -99) then mother_ed_miss =1; else mother_ed_miss=0;

```

```

if education_father = 1 then dadLTHS=1; else dadLTHS=0;
if education_father = 2 then dadHS = 1; else dadHS=0;
if education_father = 3 then dadsocol=1; else dadsocol =0;
if education_father = 4 then dadassoc = 1; else dadassoc =0;
if education_father = 5 then dadbach=1; else dadbach=0;
if education_father = 6 then dadgrad=1; else dadgrad=0;
if education_father in (7,8) then dadprof=1; else dadprof=0;
if education_father = 9 then dadDKed =1 ;else dadDKed=0;
if education_father in (., -99) then father_ed_miss =1; else father_ed_miss=0;

```

```

highestEd=max(education_mother, education_father);

```

```

if highestEd = 1 then ParLTHS=1; else ParLTHS=0;
if highestEd = 2 then ParHS=1; else ParHS=0;
if highestEd = 3 then Parsocol=1; else Parsocol=0;
if highestEd = 4 then Parassoc=1; else Parassoc=0;
if highestEd = 5 then Parbach=1; else Parbach=0;
if highestEd = 6 then Pargrad=1; else Pargrad=0;
if highestEd in (7,8) then Parprof=1; else Parprof=0;
if highestEd = 9 then parDKed=1; else parDKed=0;
if highestEd in (., -99) then paredmis =1; else paredmis=0;

```

```

if highestEd =1 then ParEd=1;
if highestEd=2 then ParEd=2;
if highestEd=3 then ParEd=3;
if highestEd=4 then ParEd=4;
if highestEd=5 then ParEd=5;
if highestEd=6 then ParEd=6;
if highestEd in (7,8) then ParEd=7;
if highestEd in (9,.,-99) then ParEd = -99;
if highestEd = 9 then parDKed=1; else parDKed=0;

```

```

* instiution type;

```

```

if InstType = 1 then fourpub = 1; else fourpub = 0;
if InstType = 2 then fourpriv = 1; else fourpriv =0;
if InstType = 3 then twopub = 1; else twopub =0;

* number of years enrolled;

if yearsenrolled = 1 then first_year = 1; else first_year=0;
if yearsenrolled in (2:5) then other_cohort = 1; else other_cohort=0;
run;

```

## Mplus Code Full Model

TITLE:

Initial CFA

DATA:

FILE IS C:\Users\Christina Glenn\Dropbox\Dissertation\Data\NSFW2014Mplus.csv;

VARIABLE:

NAMES ARE

studentid instcode InstType race yearsenrolled gpa\_value

age

spendmor want budget spending bills savings checks

accting timely beyond

pcomfort pmoneymg

pmodel childall teenall HSwork save bank invest

HSfin Collfin impsoc fined expsoc monexp

inc DKinc PNAinc pinc

pDKinc pincPNA  
confident mmwell FSE fin1 fin2 fin3 fin4 fin5  
finknow  
gpacat agecat male female  
white black hispanic asian other mixed  
parEd parDKed fourpub fourpriv twopub first\_year;

!names of variables in the data set  
USEVARIABLES = gpa\_value  
age accting timely beyond  
impsoc fined expsoc monexp inc  
confident mmwell  
fin1 fin2 fin3 fin4 female  
black hispanic asian other mixed  
parEd fourpriv twopub first\_year ;

CATEGORICAL ARE fin1 fin2 fin3 fin4;

MODEL:

Cfinsoc ON female

black  
asian  
hispanic  
mixed  
other  
inc  
pared  
fourpriv  
twopub  
age  
gpa\_value  
first\_year;

CFSE BY confident \*(L1)  
mmwell (L1);

Cfinsoc BY  
impsoc\*  
fined  
expsoc  
monexp;

Cfinbehav BY accting\*

timely

beyond;

Cfinknow BY fin1\*

fin2

fin3

fin4;

CFSE@1;

Cfinsoc@1;

Cfinbehav@1;

Cfinknow@1;

[CFSE@0];

[Cfinsoc@0];

[Cfinbehav@0];

[Cfinknow@0];

Cfinbehav ON Cfinknow

CFSE

Cfinsoc;

CFSE ON Cfinknow

CFinsoc;

Cfinknow ON Cfinsoc;

! Construc BY race\* yearsenrolled  
! spendmor want budget spending bills savings checks finbehav  
! pcomfort pmoneymg pmodel childall teenall  
! HSwork save bank invest HSfin Collfin expsoc impsoc finsoc noinc  
! inc2500 inc5000 inc7500 inc10k inc15k inc20k inc25k inc30k incGT30k DKinc PNAinc  
! pincLT15k pinc30k pinc40k pinc60k pinc80k pinc100k pinc150k  
! pinc200k pincG200 pDKinc pincPNA confident mmwell  
! FSE finknow fin1 fin2 fin3 fin4 fin5  
! gpacat agecat male female  
! white black hispanic asian other mixed momLTHS momHS momsocol momassoc  
! mombach momgrad momprof  
! momDKed dadLTHS dadHS dadsocol dadassoc dadbach dadgrad dadprof dadDKed  
! highestEd parLTHS parHS parsocol parassoc parbach pargrad parprof parDKed  
! paredmis fourpub fourpriv;

!BY: define latent variables

! the first factor loading is fixed at 1.0 by default

!: free a parameter

!estimate factor loading of Great, Cheerful, and Happy

!FSE@1.0;

!@: fix a parameter at a specific value

!fix the variance of Positive at 1.0

OUTPUT:

modindices

TECH1

!request parameter specifications and starting values

STANDARDIZED;

!request two standardized coefficient

**Mplus Code Split Model**

TITLE:

Initial CFA

DATA:

FILE IS C:\Users\Christina Glenn\Dropbox\Dissertation\Data\NSFW2014Mplus.csv;

VARIABLE:



NAMES ARE

studentid instcode InstType race yearsenrolled gpa\_value  
age  
spendmor want budget spending bills savings checks  
accting timely beyond  
pcomfort pmoneymg  
pmodel childall teenall HSwork save bank invest  
HSfin Collfin impsoc fined expsoc monexp  
inc DKinc PNAinc pinc  
pDKinc pincPNA  
confident mmwell FSE fin1 fin2 fin3 fin4 fin5  
finknow  
gpacat agecat male female  
white black hispanic asian other mixed  
parEd parDKed fourpub fourpriv twopub first\_year;  
!names of variables in the data set  
USEVARIABLES = gpa\_value age  
accting timely beyond HSfin Collfin  
impsoc expsoc monexp inc  
confident mmwell  
fin1 fin2 fin3 fin4 female  
black hispanic asian other mixed

parEd fourpriv twopub first\_year;

CATEGORICAL ARE fin1 fin2 fin3 fin4;

MODEL:

Cfinsoc ON female

black

asian

hispanic

mixed

other

inc

pared

fourpriv

twopub

age

gpa\_value

first\_year;

Cfined ON

female

black

asian

hispanic

mixed

other

inc

pared

fourpriv

twopub

age

gpa\_value

first\_year;

CFSE BY confident \*(L1)

mmwell (L1);

Cfinsoc BY

impsoc\*

expsoc  
monexp;

Cfined BY  
HSfin\* (L1)  
Collfin (L1);

Cfinbehav BY accting\*  
timely  
beyond;

Cfinknow BY fin1\*  
fin2  
fin3  
fin4;

CFSE@1;  
Cfinsoc@1;  
Cfinbehav@1;  
Cfinknow@1;  
Cfined@1;

[CFSE@0];  
[Cfinsoc@0];  
[Cfinbehav@0];  
[Cfinknow@0];  
[Cfined@0];

Cfinbehav ON Cfinknow

CFSE  
Cfinsoc  
Cfined;

CFSE ON Cfinknow

CFinsoc  
Cfined;

Cfinknow ON Cfinsoc

Cfined;

Cfined ON Cfinsoc;

! Construc BY race\* yearsenrolled  
 ! spendmor want budget spending bills savings checks finbehav  
 ! pcomfort pmoneymg pmodel childall teenall  
 ! HSwork save bank invest HSfin Collfin expsoc impsoc finsoc noinc  
 ! inc2500 inc5000 inc7500 inc10k inc15k inc20k inc25k inc30k incGT30k DKinc PNAinc  
 ! pincLT15k pinc30k pinc40k pinc60k pinc80k pinc100k pinc150k  
 ! pinc200k pincG200 pDKinc pincPNA confident mmwell  
 ! FSE finknow fin1 fin2 fin3 fin4 fin5  
 ! gpacat agecat male female  
 ! white black hispanic asian other mixed momLTHS momHS momsocol momassoc  
 ! mombach momgrad momprof  
 ! momDKed dadLTHS dadHS dadsocol dadassoc dadbach dadgrad dadprof dadDKed  
 ! highestEd parLTHS parHS parsocol parassoc parbach pargrad parprof parDKed  
 ! paredmis fourpub fourpriv;

!BY: define latent variables

! the first factor loading is fixed at 1.0 by default

!: free a parameter

!estimate factor loading of Great, Cheerful, and Happy

!FSE@1.0;

!@: fix a parameter at a specific value

!fix the variance of Positive at 1.0

OUTPUT:

modindices

TECH1

!request parameter specifications and starting values

STANDARDIZED;

!request two standardized coefficient

### **Mplus Code Indirect Effects**

TITLE:

Initial CFA

DATA:

FILE IS C:\Users\Christina Glenn\Dropbox\Dissertation\Data\NSFW2014Mplus.csv;

VARIABLE:

NAMES ARE

studentid instcode InstType race yearsenrolled gpa\_value

age

spendmor want budget spending bills savings checks

accting timely beyond

pcomfort pmoneymg

```

pmodel childall teenall HSwork save bank invest
HSfin Collfin impsoc fined expsoc monexp
inc DKinc PNAinc pinc
pDKinc pincPNA
confident mmwell FSE fin1 fin2 fin3 fin4 fin5
finknow
gpacat agecat male female
white black hispanic asian other mixed
parEd parDKed fourpub fourpriv twopub first_year;

!names of variables in the data set
USEVARIABLES = gpa_value age
accting timely beyond
impsoc fined expsoc monexp inc
confident mmwell
fin1 fin2 fin3 fin4 female
black hispanic asian other mixed
parEd fourpriv twopub first_year ;

CATEGORICAL ARE fin1 fin2 fin3 fin4;

```



MODEL:

Cfinsoc ON female

black

asian

hispanic

mixed

other

inc

pared

fourpriv

twopub

age

gpa\_value

first\_year;

CFSE BY confident \*(L1)

mmwell (L1);

Cfinsoc BY

impsoc\*

expsoc  
monexp  
fined;

Cfinbehav BY accting\*  
timely  
beyond;

Cfinknow BY fin1\*  
fin2  
fin3  
fin4;

CFSE@1;  
Cfinsoc@1;  
Cfinbehav@1;  
Cfinknow@1;

[CFSE@0];  
[Cfinsoc@0];

[Cfinbehav@0];

[Cfinknow@0];

Cfinbehav ON Cfinknow

CFSE

Cfinsoc;

CFSE ON Cfinknow

CFinsoc;

Cfinknow ON Cfinsoc;

MODEL INDIRECT:

Cfinbehav IND Cfinknow Cfinsoc;

Cfinbehav IND CFSE Cfinsoc;

! Construc BY race\* yearsenrolled

! spendmor want budget spending bills savings checks finbehav

! pcomfort pmoneymg pmodel childall teenall  
 ! HSwork save bank invest HSfin Collfin expsoc impsoc finsoc noinc  
 ! inc2500 inc5000 inc7500 inc10k inc15k inc20k inc25k inc30k incGT30k DKinc PNAinc  
 ! pincLT15k pinc30k pinc40k pinc60k pinc80k pinc100k pinc150k  
 ! pinc200k pincG200 pDKinc pincPNA confident mmwell  
 ! FSE finknow fin1 fin2 fin3 fin4 fin5  
 ! gpacat agecat male female  
 ! white black hispanic asian other mixed momLTHS momHS momsocol momassoc  
 ! mombach momgrad momprof  
 ! momDKed dadLTHS dadHS dadsocol dadassoc dadbach dadgrad dadprof dadDKed  
 ! highestEd parLTHS parHS parsocol parassoc parbach pargrad parprof parDKed  
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!fix the variance of Positive at 1.0

OUTPUT:

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TECH1

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STANDARDIZED;

!request two standardized coefficient