Financial Literacy and Long- and Short-Term Financial Behavior in Different Age Groups

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The purpose of this study was to examine the relationship between financial literacy and financial behaviors among various age groups. Financial literacy was measured in three ways: objective financial knowledge, subjective financial knowledge or confidence, and subjective financial management ability. The age groups were 18–24, 25–34, 35–44, 45–54, 55–64, and 65 and older. Long-term financial behavior referred to retirement saving and investing behavior, whereas short-term financial behavior referred to spending and emergency saving behavior. In the full sample, both objective and subjective financial literacy variables were positively associated with long- and short-term financial behaviors. In the age subsamples, subjective financial knowledge or confidence was more strongly related to long- and short-term financial behavior than either objective financial knowledge or subjective financial management ability in the younger age groups. In the older age groups, objective financial knowledge was more strongly related to long-term financial behavior than either of the other two measures of financial literacy.

Keywords: age groups, financial behavior, financial knowledge, financial literacy

The recent economic downturn, known as *the Great Recession*, has magnified overall awareness of financial illiteracy and its impact on our economy. One response has been increased academic research focusing on financial literacy as well as renewed interest in financial education and related policy (Schuchardt et al., 2007). Financial education is increasingly prevalent in high schools, colleges (Hira, 2012; Mandell, 2008; Mandell & Klein, 2009), and workplaces (Servon & Kaestner, 2008). Greater attention to financial literacy is reflected in increased interest in state mandates for financial education in high schools as well as the creation of entities addressing financial literacy, such as the Financial Literacy and Education Commission and the Consumer Financial Protection Bureau.

Financial decisions at any stage in life can have lasting effects on the consumer and the household. Indeed, James, Boyle, Bennett, and Bennett (2012) suggested that increased levels of financial literacy in the younger years facilitate better decisions that lead to a higher quality of life in later years. Age and experience change an individual's perspective. Recent studies have shown that consumers in different age groups display different financial behaviors (Robb, Babiarz, & Woodyard, 2012; Zick, Mayer, & Glaubitz, 2012). Each age group has its own perspectives, influences, and pressures (Zick et al., 2012). These differences are not surprising given changes in consumers' financial needs over time, but how does financial literacy influence long- and short-term financial behaviors in different age groups? That is the focus of this article. In this article, long-term financial behavior includes retirement saving behavior and investing behavior, whereas short-term financial behavior includes spending and emergency saving behavior. This study provides a unique contribution to the literature in the specific examination of age regarding these financial behaviors. It examines the relationship between financial literacy and financial behaviors for the sample in general as well as in each of six age groups.

Many research studies have examined age groups defined by generation, such as Baby Boomers, Generation X, Generation Y, and Millennials (see, e.g., DeVaney & Chiremba, 2005; Kowske, Rasch, & Wiley, 2010; Lancaster, 2003). Based on early work by Karl Mannheim (1952), generations are defined as age groups that were exposed to similar

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cultural and societal events and have exhibited similar perspectives and views. Researchers often use generalizations to describe important characteristics of a generation (Deyoe & Fox, 2012; Twenge & Campbell, 2008). For example, Generation Y (1982–1999) has been described as having higher self-esteem, narcissism, lower dependence on social approval, and a greater external locus of control than their older counterparts—characteristics that may have a bearing on how they view or manage their money (Twenge & Campbell, 2008).

However, compared to defining age groups by generations, age or stage in life may provide a more useful approach to analyze consumer needs related to financial matters. Indeed, Wong, Gardiner, Lang, and Coulon (2008) found that generational stereotypes were less meaningful than age to provide insight into differences between individuals' behavior. Given that the life of a typical 20 year old is vastly different from the life of a 30 year old, both of whom are in the same generation, Arnett (2007) concluded it was unproductive to lump them into the same group for analysis. The diversity of the Baby Boomer generation further illustrates this point. Commonly defined as born between 1946 and 1964, some have already retired, whereas others are still in midcareer. The financial goals of individuals within the Baby Boomer generation likely vary based on these different perspectives.

Thus, this study examines the relationship between financial literacy and financial behaviors in six different age groups: 18–24, 25–34, 35–44, 45–54, 55–64, and 65 and older. In this article, financial literacy is assessed in three ways: objective financial knowledge, subjective financial knowledge or confidence, and subjective financial management ability. No study has addressed a research question examining the relationship between both objectively and subjectively assessed financial knowledge as well as subjectively assessed financial management ability with financial behaviors in an analysis by age groups. Understanding how these relationships vary by age group will give researchers, educators, and policy makers a fresh perspective on financial literacy that will help guide future research, curriculum, and policy for consumers of various ages.

Literature Review

Age Matters

A central theme of research related to decision making in general as well as financial decision making is knowledge increasing over time. Alhenawi and Elkhal (2013) reported that financial knowledge improves with age. One explanation for this observation is described in a segment of research that distinguished between fluid intelligence and crystallized intelligence. Fluid intelligence is the capability to manipulate information and discriminate and perceive relationships between new and old information. Crystallized intelligence is accumulated knowledge based on experience and habits (Cattell, 1943; Li, Baldassi, Johnson, & Weber, 2013).

Positing that higher levels of crystallized intelligence provide older adults with a basis for good decision making, researchers have found that older people were better decision makers than younger people. Furthermore, research provides evidence that younger adults tend to perform better on tests of fluid intelligence than older adults; however, older adults perform better on tests of crystallized intelligence (Castel et al., 2011; Crawford & Stankov, 1996). Thus, knowledge accumulation may offset any cognitive impairment due to age.

Research specific to financial knowledge also supports the theme of knowledge increasing over time. Agarwal, Driscoll, Gabaix, and Laibson (2009) found that experience and acquired knowledge increased with age, whereas fluid intelligence declined. Using a combination of proprietary datasets dealing with credit, auto loans, mortgages, and credit card fees, they reported that middle-aged adults borrowed more effectively, paid lower interest rates, and paid fewer fees than either younger adults or older adults. Younger borrowers tended to have less experience yet had a high level of analytical function, whereas older borrowers tended to have higher levels of experience yet less analytical function (Agarwal et al., 2009). These findings complement a study by Delavande, Rohwedder, and Willis (2008), who found that older respondents scored higher on the Cognitive Economics Survey than younger respondents. In addition, a study by Xiao, Chen, and Sun (2015) reported that older age consumers had higher levels of subjective and objective financial literacy and perceived financial capability than their younger counterparts.

As young adults mature, the transition into financial self-sufficiency creates a need for increased financial knowledge and skills to cope with more financial obligations. Shim, Serido, Bosch, and Tang (2013) stated that meaningful changes occur in young adults in their teens and twenties. Young adults

were most familiar with financial behaviors such as budgeting, saving, and spending as opposed to paying, borrowing, and investing—which may not yet be fully developed skills in this age group. A possible hindrance to gaining financial experience may be the fact that many young adults live at home with their parents even after completing college. The Pew Research Center reported in 2012 that 56.2% of young adults between the ages of 18 and 24 were living with their parents. This compares to 16% of young adults between the ages of 25 and 31 living with their parents (Fry, 2013).

Financial Literacy

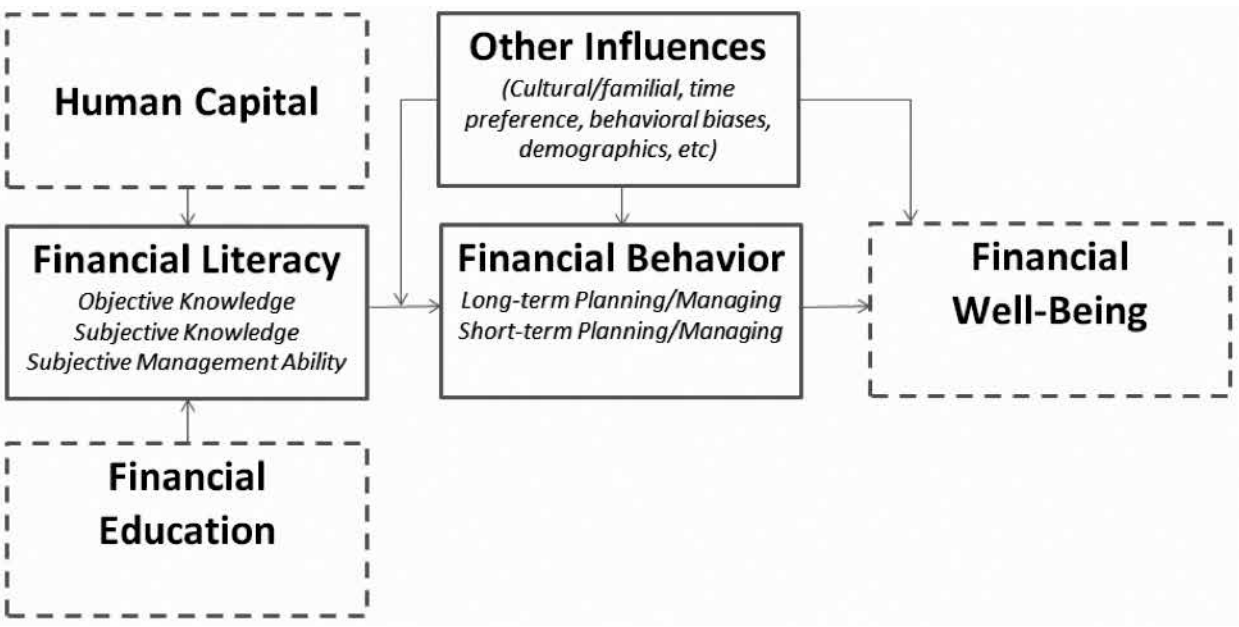
Financial literacy, in general, consists of various constructs and has been discussed and defined in various ways in the literature. Huston (2010) suggested defining financial literacy as "how well an individual can understand and use personal finance-related information" (p. 306). Huston (2012) considers financial literacy to be a component of human capital. Remund (2010) suggested that financial literacy has a relationship with a person's competency for managing money.

Huston (2010) proposed a model that includes relationships between financial literacy, knowledge, education, behavior, and financial well-being. In this model, inputs into financial literacy are human capital and financial education. Other influences such as demographics, culture, and family influences are associated with financial behaviors. In Huston's model, financial literacy involves financial knowledge and application. The application section emphasizes ability and confidence (Figure 1).

In recent years, researchers have created many types of assessments aimed at measuring financial literacy and levels of financial knowledge. A set of five questions put forth by Lusardi and Mitchell (2007b) has been used extensively in the literature. The questions are a mixture of numerical and financial concept questions created to measure objective financial knowledge. Although a longer assessment (Knoll & Houts, 2012) of perhaps 20 questions may be desirable, the Lusardi and Mitchell questions used here have been accepted by many in the field as standard and have been administered in various settings.

Previous research aimed at establishing the link between financial literacy and financial behaviors has produced various results. A lack of financial knowledge has been associated with behaviors that led to financial mistakes such as over borrowing, high interest rate mortgages, and limited saving and investment (Lusardi, 2008). According to Braunstein

Figure 1. A conceptual framework of financial literacy.[a]



[a]Huston, 2010.

and Welch (2002), a deficiency in financial knowledge impacts the day-to-day management of finances as well as the ability to save money for the long term. For example, financial knowledge has been associated with positive financial behaviors such as having a checking account, paying bills on time, tracking expenses, having a savings account, and having an emergency fund (Hilgert, Hogarth, & Beverly, 2003). Having investments and saving for the long term also was associated with higher levels of financial knowledge in a study specific to Washington State residents (Moore, 2003). In contrast, some researchers did not find a link between financial literacy and financial behaviors, including Mandell and Klein (2009) who focused on individuals who completed high school financial education. Most recently, in a meta-analysis of 168 papers covering 201 prior studies, Fernandes, Lynch, and Netemeyer (2014) reported that controlling for psychological traits weakens the observed relationship between financial literacy and financial behavior.

Previous research has identified several important control variables to include when examining the relationship between financial literacy and financial behaviors. These variables include gender, age, race, marital status, presence of children, employment status, education, and income (Fernandes et al., 2014; Robb & Woodyard, 2011; Xiao, Chen, & Chen, 2014; Xiao et al., 2015; Zick et al., 2012). For example, minorities and those with less education and income tend to score lower on measures of financial knowledge and women tend to score lower than men.

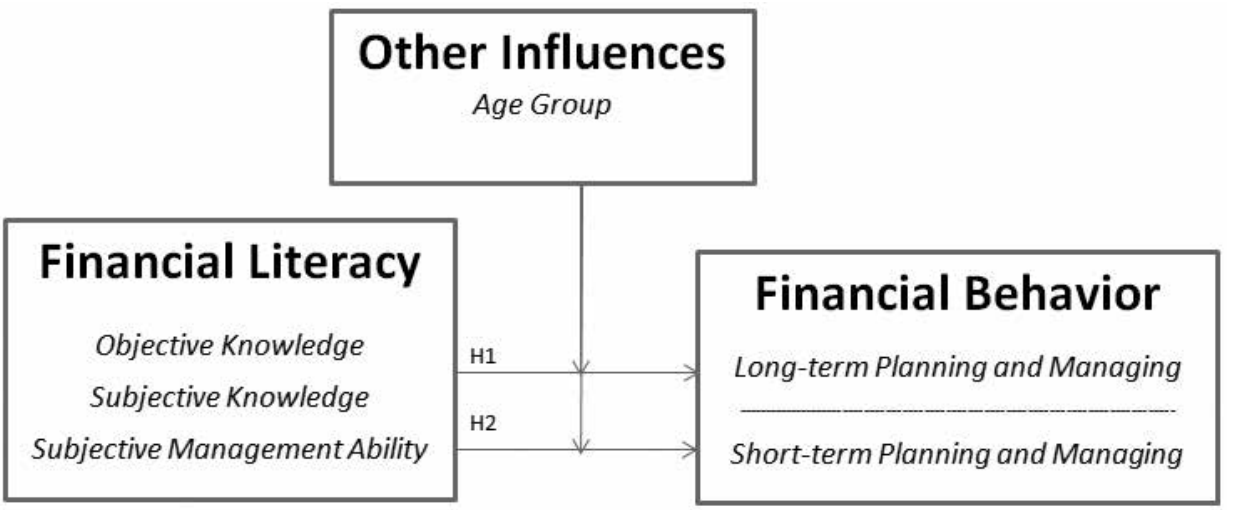
Theoretical Framework

Huston's (2010) model has been modified to create the conceptual framework for this study which considers general human capital and financial education as contributors to financial literacy (Figure 2). One important difference between Huston's model and the one used in this study is that in Huston's model, financial well-being is the outcome variable rather than financial behavior.

Financial literacy is defined as objective financial knowledge as well as subjective financial knowledge or confidence and subjective financial management ability. In many ways, the conceptualization of financial literacy used in this research is akin to the concept of financial capability, which often is described as being composed of an individual's objective knowledge, perceived financial ability, and performance of positive financial behaviors (Xiao et al., 2014; Xiao et al., 2015).

The specific financial behaviors examined in this study were long- and short-term financial behaviors. The primary "other influence" examined in this research was age groups, but other demographic characteristics, chosen based on previous research, were included as control variables. Specifically, the

Figure 2. Financial literacy conceptual framework used to test hypotheses.



Note. H1 = hypothesis 1; H2 = hypothesis 2.

control variables were gender, race, marital status, presence of dependent children, education, and income. Based on the above discussion, we tested the following hypotheses:

H1: After controlling for other demographic characteristics, financial literacy is positively related to long-term financial behaviors, and the relationship is stronger for objective financial knowledge in older age groups.

H2: After controlling for other demographic characteristics, financial literacy is positively related to short-term financial behaviors, and the relationship is stronger for subjective financial ability in younger age groups.

Methods

Data and Sample

The data used for this study came from the 2012 National Financial Capability Study State-by-State Survey Instrument sponsored by the Financial Industry Regulatory Authority (FINRA). The questionnaire was administered on a state-by-state basis to achieve approximately 500 observations from each state and the District of Columbia. The self-reported data were collected from July to October 2012 and made available to researchers in May 2013 (FINRA, 2013). The national data were weighted to reflect the U.S. census based on data from the American Community Survey. The supplied weights were frequency weights and therefore used for descriptive statistics and not for the regressions where the weights would artificially induce statistical significance (Solon, Haider, & Wooldridge, 2015). The final sample used for this study was 23,727; dropped from the sample were observations where the respondent chose "prefer not to say" as their answer to the questions dealing with financial behaviors and objective financial knowledge and "prefer not to say" or "don't know" to the subjective knowledge and management questions. In the case of the objective financial knowledge questions, an answer of "don't know" was coded as incorrect.

Dependent Variables. A long-term financial behavior index was created based on responses to three survey questions that asked if the respondent had ever tried to figure out their retirement needs (either before or after retirement), if the respondent had any retirement plans (either through an employer or not), and if the respondent had any investments or securities outside of their retirement accounts. All variables were coded 1 for *yes* and 0 for *no*. The index was created by adding the responses to the three questions that ranged 0–3.

A short-term financial behavior index was created based on three survey questions that asked if the respondent had an emergency fund, if the respondent spent less than or equal to his or her income, and if the respondent overdrew his or her checking account occasionally. The emergency fund question was coded 1 for *yes* and 0 for *no*. The spending question asked, regarding the past year, if household spending was less than, more than, or equal to income. If the respondent indicated either less than or equal to income, the variable was coded with a 1, otherwise a 0. If the respondent answered "no" to the checking overdraft question (did not occasionally overdraw account), the variable was coded with a 1, otherwise 0. The index was created by adding the responses to the three questions that ranged 0–3.

Independent Variables. A primary focus of this research was age groups. In the survey, there were six age groups. Respondents were coded 1 if they were in the respective age group and 0 otherwise. The age groups were 18–24, 25–34, 35–44, 45–54, 55–64, and 65 and older.

Seven other demographic characteristics were included as control variables in the analysis. Five of the variables were dichotomized and defined as follows: gender (male = 1, female = 0), race (white = 1, 0 otherwise), marital status (married = 1, 0 otherwise), presence of children (one or more financially dependent children living at home = 1, 0 otherwise), and employment status (employed = 1, 0 otherwise). Education and income were coded as several binary variables: high school, some college, college graduate, and postsecondary graduate; income less than $25,000, $25,001–$50,000, $50,001–$100,000, and $100,001 or more. The high school variable was the reference group for education, whereas the less than $25,000 variable was the reference group for income.

The financial literacy variables were defined to reflect the conceptual framework. Financial knowledge (the objectively assessed financial knowledge variable) was based on the number of correct answers to the five Lusardi and Mitchell (2007b) questions (0–5). Confidence (the subjectively assessed financial knowledge variable) was based on a single question with responses measured on a scale of 1 (*very low*) to 7 (*very high*). Ability (the subjectively assessed

financial management ability variable) was based on a question with responses measured on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*).

The three components of financial literacy had very low correlations with one another, indicating that the three measures were likely not measuring the same construct and each contributed a unique element to the overall measure of financial literacy. The correlation coefficient for objective financial knowledge and confidence was .025, for objective financial knowledge and ability was .025, and for confidence and ability was .042. This approach is similar to previous literature; notably, Robb and Woodyard (2011) also reported that financial knowledge and financial confidence had a low correlation but both affect behavior.

Data Analysis Procedures

In the ordered logistic regression, the financial behavior index variable (long term or short term) was the dependent variable. Both the long- and the short-term financial behavior variable indices (0–3) represent the number of behaviors performed by the respondent. The exact values represented by the dependent variable in an ordered logistic regression are not relevant except to indicate that larger values are assumed to correspond to a higher outcome (Stata Press, 2013). A multinomial logistic regression is more appropriate when the dependent variable is categorical, but not ordered, as in region of residence (north, south, east, or west). The use of the ordered logit model makes it possible to calculate the likelihood of each level even though the actual distance between the values cannot be measured (Issa & Kogan, 2014). Statistical tests were run for the variance inflation factor (VIF). The VIF test indicated no multicollinearity between the independent variables used in this study.

First, the full sample was used in an ordered logistic regression with the 18–24 age group as the reference group to test the age group effect. Then, the age categories were used to restrict the sample and six ordered logistic regressions were run, one for each age group. This allowed an intragroup analysis of the relationship of financial behaviors with financial literacy.

Results

Descriptive Statistics

Descriptive statistics are reported in Table 1. The educational profile of the sample revealed the largest group as those who had completed high school or less education (37.0%), followed closely by those respondents with some college education (36.3%). Slightly more than one quarter of the respondents had a college or postsecondary degree (26.7%). Forty-nine percent of the sample were male, two thirds were white (66.8%), more than one half were married (54.2%),

TABLE 1. Descriptive Statistics (*N* = 23,727)

Variable	Frequency	*M* (*SD*)
Education (%)		
High school or less	37.01	
Some college	36.33	
College graduate	16.42	
Postsecondary graduate	10.24	
Male (%)	49.03	
White (%)	66.80	
Married (%)	54.17	
Dependent children (%)	39.56	
Employed (%)	53.57	
Income (%)		
$0–$25,000	25.79	
$25,001–$50,000	25.89	
$50,001–$100,000	30.82	
$100,001+	17.51	
Age (%)		
18–24	12.09	
25–34	18.49	
35–44	16.54	
45–54	19.72	
55–64	17.75	
65 +	15.40	
Objective financial knowledge (0–5)		2.96 (1.43)
0 Correct	6.06	
1 Correct	11.59	
2 Correct	18.49	
3 Correct	23.43	
4 Correct	25.43	
5 Correct	15.00	
Subjective financial knowledge (1–7)		5.15 (1.29)
Subjective ability (1–7)		5.68 (1.58)

Note. Statistics are weighted using national weights provided by FINRA [wgt_n2].

and more than one third (39.6%) had dependent children at home. For income, the largest group (30.8%) earned between $50,000 and $100,000 annually, whereas about a quarter earned less than $25,000 and another quarter earned between $25,000 and $50,000. Less than one fifth (17.5%) earned more than $100,000. Each of the age groups represented less than 20% of the sample; the age group 45–54 was the largest at 19.7%, whereas the age group 18–24 was the smallest (12.1% of the sample).

For objectively assessed financial knowledge, the mean for the set of five financial knowledge questions was 2.96 (with a range of 0–5), indicating an average of three out of five questions were answered correctly by the full sample. About three-quarters (76.8%) of the respondents answered both the compound interest and the mortgage question correctly. Fewer respondents answered the other three questions correctly—inflation (63%), mutual fund (50%), and bond prices (29%). A small percentage of respondents (15%) answered all five questions correctly. The results presented here may vary slightly from other reports based on these same data because an answer of "I don't know" was considered incorrect here, and respondents who answered "prefer not to say" were dropped from the sample.

Progressively, each age group answered a larger proportion of the objective questions correctly. The greatest difference in financial knowledge scores across age groups was for the inflation question: 81.1% of the respondents in the oldest age group answered this question correctly compared to 37.3% of the youngest age group. The total score for the five objective financial knowledge questions progressively increased from a mean of 2.1 for the youngest age group to a mean of 3.5 for the oldest age group. The means for the confidence and ability questions were 5.15 and 5.68, respectively, for the full sample. Both confidence (from a mean of 4.8 to a mean of 5.5) and financial management ability (from a mean of 5.1 to a mean of 6.2) also increased with age.

Financial Literacy and Long-Term Financial Behavior

The first hypothesis explored the relationship between financial literacy (financial knowledge, confidence, and ability) and long-term financial planning and managing behaviors, first examining the age group effect and then analyzing differences by age group. The first hypothesis was supported; greater financial literacy was positively associated with the index of long-term financial behaviors (planning for retirement, having a retirement account, and having investments). Table 2 reports the results of the ordered logistic regression for the full sample. Age group was positively and significantly related to the index of long-term financial behaviors.

The odds ratios are referred to for interpretation of the results. The odds ratio of 1.29 for the relationship between the long-term financial behavior index and objective financial knowledge indicates that the odds were 29% higher that a respondent with greater objective financial knowledge had engaged in one or more of the long-term financial behaviors than a respondent with less objective financial knowledge. Likewise, the confidence variable, subjective financial knowledge, was positively and significantly related with long-term financial behaviors. The odds ratio of 1.3 indicates that the odds were 30% higher that a respondent with greater confidence had engaged in one or more of the long-term financial behaviors. The results for ability, the subjective financial management ability variable, also were significant, but at 1.04, the odds ratio was much lower. The odds were only 4% higher that respondents who reported greater subjective financial management ability had engaged in the long-term behaviors relative to respondents with lower ability.

Age groups, with the 18–24 age group as the reference group, were significantly and positively related to long-term financial behaviors. The odds increased with each age group; the odds were higher by 54% that the 25–34 age group had engaged in the long-term behaviors than for the 18–24 age group. The odds were 4.73 times larger for the oldest age group than for the youngest age group.

Each of the control variables was significantly related to engaging in one or more of the long-term financial behaviors except the presence of dependent children. The odds ratios for education and income were higher than the odds ratios for each of the financial literacy components, indicating that in addition to financial literacy, general education and level of income play an important role in explaining engagement in the long-term financial behaviors studied here.

Table 3 reports results of the ordered logistic regressions examining the relationship of financial literacy with long-term

TABLE 2. Ordered Logistic Regression With Long-Term Financial Behavior Index as Dependent Variable (*N* = 23,727)

	Long-Term Financial Behavior Index		
Variable	***Coefficient***	***SE***	***OR***
Objective financial knowledge	0.251***	(0.011)	1.29
Subjective financial knowledge	0.264***	(0.012)	1.30
Subjective ability	0.036***	(0.009)	1.04
Age group (reference group 18–24)			
25–34	0.433***	(0.057)	1.54
35–44	0.451***	(0.058)	1.57
45–54	0.668***	(0.055)	1.95
55–64	1.071***	(0.057)	2.92
65+	1.555***	(0.060)	4.73
Gender	−0.128***	(0.026)	0.88
Race	0.147***	(0.030)	1.16
Marital status	0.207***	(0.030)	1.23
Dependent children	−0.018***	(0.030)	0.98
Education (reference group less than college)			
Some college	0.326***	(0.032)	1.39
College graduate	0.727***	(0.038)	2.07
Postsecondary graduate	0.842***	(0.046)	2.32
Income (reference group less than $25,000)			
$25,001–$50,000	1.033***	(0.039)	2.81
$50,001–$100,000	1.838***	(0.042)	6.29
$100,001 and more	2.453***	(0.050)	11.62
Employment	0.419***	(0.029)	1.52

Note. Pseudo $R^2 = 0.20$.
***$p < .001$.

financial planning and managing behaviors in the six different age groups. The relationships between the index of long-term financial behaviors and both objective financial knowledge and confidence in each age group were significant. The relationship with financial management ability was significant only in the two oldest age groups, and the odds ratios were relatively low at 1.08.

The odds ratios for objective financial knowledge increased with each age group. For example, the odds of an individual with a higher, rather than a lower, level of financial knowledge engaging in the long-term financial behaviors increased from 18% in the youngest age group to 38% in the oldest age group. In contrast, the odds ratios for confidence *decreased* with each age group until age 44 (from 38% to 24%), then remained relatively unchanged before increasing to 32% for the 65 and older age group. The odds ratios for confidence were higher than for objective financial knowledge in the two youngest age groups but the opposite was true for the three oldest age groups.

Financial Literacy and Short-Term Financial Behavior

The second hypothesis explored the relationship between financial literacy (financial knowledge, confidence, and ability) and short-term financial planning and managing behaviors, first examining the age group effect and then analyzing differences by age group. Overall, the second hypothesis was supported; greater financial literacy was positively

TABLE 3. Ordered Logistic Regressions by Age Group With Long-Term Financial Behavior Index as Dependent Variable

Variable		*Coefficient*	*SE*	*OR*
18–24	(N = 2,353)	Pseudo R^2 = 0.10		
Objective financial knowledge		0.162***	(0.035)	1.18
Subjective financial knowledge		0.323***	(0.039)	1.38
Subjective ability		−0.047	(0.030)	0.95
25–34	(N = 4,021)	Pseudo R^2 = 0.15		
Objective financial knowledge		0.183***	(0.024)	1.2
Subjective financial knowledge		0.274***	(0.028)	1.32
Subjective ability		0.038	(0.022)	1.04
35–44	(N = 4,027)	Pseudo R^2 = 0.18		
Objective financial knowledge		0.226***	(0.025)	1.25
Subjective financial knowledge		0.220***	(0.029)	1.25
Subjective ability		0.017	(.022)	1.02
45–54	(N = 4,860)	Pseudo R^2 = 0.19		
Objective financial knowledge		0.282***	(0.024)	1.33
Subjective financial knowledge		0.255***	(0.025)	1.29
Subjective ability		0.020	(0.020)	1.02
55–64	(N = 4,490)	Pseudo R^2 = 0.19		
Objective financial knowledge		0.300***	(0.026)	1.35
Subjective financial knowledge		0.234***	(0.027)	1.26
Subjective ability		0.076***	(0.022)	1.08
65+	(N = 3,976)	Pseudo R^2 = 0.18		
Objective financial knowledge		0.322***	(0.027)	1.38
Subjective financial knowledge		0.277***	(0.031)	1.32
Subjective ability		0.076***	(0.023)	1.08

Note. Statistics for control variables are not presented but are available on request.
***$p < .001$.

associated with the index of short-term financial behaviors (having an emergency fund, spending less than or equal to income, not overdrawing a checking account occasionally). Table 4 reports the results of the ordered logistic regressions for the full sample. All but one (55–64) age group also was significantly related to the index of short-term financial behaviors. However, the relationship was negative for the three youngest age groups and significant and positive only for the oldest age group.

The odds ratio of 1.11 for the relationship between the short-term financial behavior index and objective financial knowledge indicates that the odds were 11% higher that a respondent with greater objective financial knowledge had engaged in one or more of the short-term financial behaviors than a respondent with less objective financial knowledge. Likewise, the confidence variable, subjective financial knowledge, was positively and significantly related with short-term financial behaviors. The odds ratio of 1.17 indicates that the odds were 17% higher that a respondent with greater confidence had engaged in one or more of the short-term financial behaviors. The results for ability, the subjective financial management ability variable, also were significant, but at 1.27, the odds ratio was relatively higher. The odds were 27% higher that respondents who reported greater subjective financial management ability had engaged in the short-term behaviors relative to respondents with lower ability.

TABLE 4. Ordered Logistic Regression With Short-Term Financial Behavior Index as Dependent Variable (*N* = 23,727)

	Short-Term Financial Behavior Index		
Variable	***Coefficient***	***SE***	***OR***
Objective financial knowledge	0.104***	(0.010)	1.11
Subjective financial knowledge	0.157***	(0.011)	1.17
Subjective ability	0.236***	(0.009)	1.27
Age group (reference group 18–24)			
25–34	−0.267***	(0.050)	0.77
35–44	−0.316***	(0.051)	0.73
45–54	−0.227***	(0.049)	0.80
55–64	0.072	(0.050)	1.07
65+	0.578***	(0.055)	1.78
Gender	0.077***	(0.026)	1.08
Race	0.165***	(0.029)	1.18
Marital status	0.104***	(0.029)	1.11
Dependent children	−0.559***	(0.029)	0.57
Education (reference group less than college)			
Some college	0.072*	(0.031)	1.07
College graduate	0.349***	(0.037)	1.42
Postsecondary graduate	0.349***	(0.047)	1.42
Income (reference group less than $25,000)			
$25,001–$50,000	0.437***	(0.036)	1.55
$50,001–$100,000	1.041***	(0.039)	2.83
$100,001 and more	1.641***	(0.049)	5.16
Employment	0.262*	(0.028)	1.03

Note. Pseudo $R^2 = 0.13$.
*$p < .05$. **$p < .01$. ***$p < .001$.

In addition to the key financial literacy variables, age groups, relative to the 18–24 age group, which was the reference group, were important variables in the logistic regression. However, the relationship was negative for the three youngest age groups. Interpreting the odds ratio of 0.77 for the relationship between the short-term financial behavior index and the 25–34 age group indicates that the odds were 23% lower that a respondent in that age group had engaged in one or more of the short-term financial behaviors than a respondent in the 18–24 age group. The relationship with the short-term behaviors for the oldest age group was significant and positive; relative to the 18–24 age group, the odds were 78% higher that those 65 and older had engaged in one or more of the short-term financial behaviors.

An important note here is that the driving factor in explaining these relationships appear to be the emergency fund and the checking overdraft variables. When logistic regressions were run individually for each of the three short-term financial behaviors (not published here, but available from the authors), the same pattern of relationships that was observed between the index of short-term behaviors and age groups emerged (negative in younger groups, positive in older groups) for both the emergency fund and the checking overdraft variable. The odds of having an emergency fund were lower for those in the three youngest age groups when compared to the 18–24 age group and higher only in the oldest age cohort. This was a surprising result and is discussed further in the conclusion. Regarding checking

overdrafts, the odds were lower that the two youngest age cohorts had overdrawn a checking account (relative to the 18–24 age group) and only higher that the oldest age cohort had *not* overdrawn a checking account. The spending variable was only significant in the three oldest age groups where the odds were higher that the older age groups spent within their means compared to the 18–24 age group.

In addition, Table 4 reports the relationships between the demographic characteristics and the short-term financial behavior index for the full sample. Education and income were positively and significantly related to the short-term behaviors and with increasing odds. The odds were 42% higher that respondents with college degrees had engaged in the short-term behaviors than for those with a high school education. The odds that those with incomes reported at more than $100,000 engaged in the short-term behaviors were more than five times as large as for those in the reference group with incomes of less than $25,000. In addition, the odds ratios for both education and income were greater than those for any of the financial literacy variables. All of the control variables were significant except employment and positive except the presence of dependent children.

Table 5 reports results of the ordered logistic regressions examining the relationship of financial literacy with short-term

TABLE 5. Ordered Logistic Regressions by Age Group With Short-Term Financial Behavior Index as Dependent Variable

Variable		*Coefficient*	*SE*	*OR*
18–24	(N = 2,353)	Pseudo R^2 = 0.07		
Objective financial knowledge		0.128***	(0.030)	1.14
Subjective financial knowledge		0.053	(0.031)	1.05
Subjective ability		0.260***	(0.026)	1.30
25–34	(N = 4,021)	Pseudo R^2 = 0.10		
Objective financial knowledge		0.109***	(0.023)	1.12
Subjective financial knowledge		0.101***	(0.026)	1.11
Subjective ability		0.229***	(0.021)	1.26
35–44	(N = 4,027)	Pseudo R^2 = 0.10		
Objective financial knowledge		0.108***	(0.024)	1.11
Subjective financial knowledge		0.102***	(0.027)	1.11
Subjective ability		0.260***	(0.022)	1.30
45–54	(N = 4,860)	Pseudo R^2 = 0.10		
Objective financial knowledge		0.526*	(0.023)	1.05
Subjective financial knowledge		0.186***	(0.024)	1.20
Subjective ability		0.254***	(0.020)	1.29
55–64	(N = 4,490)	Pseudo R^2 = 0.12		
Objective financial knowledge		0.090***	(0.025)	1.09
Subjective financial knowledge		0.204***	(0.026)	1.23
Subjective ability		0.225***	(0.021)	1.25
65+	(N = 3,976)	Pseudo R^2 = 0.12		
Objective financial knowledge		0.105***	(0.029)	1.11
Subjective financial knowledge		0.272***	(0.032)	1.31
Subjective ability		0.183***	(0.024)	1.20

Note. Statistics for control variables are not presented but are available on request.
*$p < .05$. ***$p < .001$.

financial planning and managing behaviors in the six different age groups. Notably, the subjective ability variable had higher odds ratios than knowledge or confidence in every age group except 65 and older. For example, in the 18–24 age group, the odds of engaging in one or more of the short-term behaviors were 14% higher for those with greater financial knowledge and 5% higher for those with more confidence but 30% higher for those with greater ability. The odds ratios for objective financial knowledge decreased from the youngest group through the 45–54 age group and then increased in the two oldest age groups. The odds ratios for confidence increased with each increase in age group after age 44. And, the odds ratios for subjective ability decreased with each increase in age after age 44.

Discussion

The overall purpose of this study was to add to the literature in the field of financial literacy by examining the relationship between financial literacy and long- and short-term financial behaviors by age group. Both hypotheses were supported; greater financial literacy was positively associated with the long-term and the short-term financial planning and managing behavior indices, first while examining the age group effect and next in separate regressions for each of the six age groups. Long-term financial behavior included retirement saving and investing behavior, whereas short-term financial behavior included spending and emergency saving behavior.

A key finding was the highly significant relationships between each of the long- and short-term behavior indices and the age group variable for the full sample. Using the 18–24 age group as a reference group, each of the age groups was progressively more likely to engage in the long-term behaviors. In addition, the odds ratios for the age groups were higher than for any of the components of financial literacy. Indeed, only income had an overall larger relationship with financial behavior than age group.

For the short-term behaviors, the significant relationships were negative compared to the 18–24 reference group for the full sample. As mentioned in the "Results" section, this is largely because of the emergency fund and checking account overdraft variables. The odds were lower for those in the youngest age groups to have an emergency fund and to overdraw a checking account when compared to the 18–24 age group. Young adults, who likely still have their parents' financial support (Fry, 2013), are less likely than those 25–54 to be balancing competing financial needs and perhaps more likely to be able to put money into an emergency fund and avoid overdrafts. And, 18–24 age group may simply have interpreted the emergency fund question differently, answering "yes" because they have parental support rather than an actual emergency fund.

In the analyses of relationships within each age group, a key finding for the long-term behaviors was that the strongest relationship shifted from subjective knowledge (confidence) for the younger age groups to objective knowledge for the older age groups. The odds of this shift increased with each age group that objective financial knowledge was associated with the long-term behaviors. In contrast, the odds decreased with each age group that subjective financial knowledge was associated with the long-term financial behaviors.

As previous research has shown that financial knowledge improves over time and with age (Delavande et al., 2008), this study goes a step further to reveal that this improved knowledge also has an increasingly stronger relationship with financial behaviors with age. Studies have shown improved financial knowledge increases the likelihood of planning for retirement (Hilgert et al., 2003; Lusardi & Mitchell, 2007a). This finding often is associated with an older age group; however, the results of this study suggest that financial knowledge plays an important role for young adults as well as those in midcareer. Confidence and subjective ability played an important role in this analysis as well. Indeed, in the younger cohorts, confidence building may be an important factor in financial education.

Results for the short-term behaviors were similar with respect to subjective ability. Key findings for the short-term behaviors indicated that subjective ability was positively associated in every age group and had a stronger relationship than financial knowledge. This is consistent with previous research in which subjective financial literacy and capability were associated with age, suggesting that adults accumulate financial capability as they age (Xiao et al., 2015). The relationship of objective knowledge with the short-term behaviors decreased with age, the opposite of the trend in the long-term behavior analysis. In other words, objective knowledge played a larger role for the younger cohorts in explaining the relationship with short-term financial behaviors

but a larger role for the older cohorts in explaining the relationship with long-term financial behaviors. Many adults acquire financial knowledge through experience, and the likelihood of exposure to retirement planning opportunities, which were the focus of the long-term behaviors, increases with age. Previous research for young adults reported experience with financial behaviors such as budgeting and spending. Conversely, older adults have experience with borrowing and investing, which may not be fully developed skills in younger adults (Shim et al., 2013), again supporting the relationship between experience and knowledge.

Subjective financial knowledge also played an important role for the younger adults. In other words, if younger adults had a higher level of confidence in financial knowledge, they were more likely to engage in both the long- and the short-term behaviors. When reporting a similar outcome in their research, Allgood and Walstad (2011) recommended further research in the area of financial behaviors and subjective financial knowledge. This research suggests that the younger cohorts may engage in positive financial behaviors if they think they can, where the older cohorts may rely on their actual knowledge.

Subjective ability was more strongly associated with short-term behaviors than with long-term behaviors. This perspective of financial ability may be yet another element of financial management confidence.

Limitations and Future Research

This study relied on the available self-reported data which has important limitations. For example, the intention of the respondent regarding the subjective questions is open to interpretation. The likeliest interpretation is that the subjective financial knowledge questions expressed the respondent's level of confidence in his or her financial understanding; however, it could reflect some degree of general optimism (or pessimism) or some other factor involving financial satisfaction (or lack of). The subjective questions preceded the objective questions and therefore did not likely influence the self-perception of the respondent regarding financial knowledge (Allgood & Walstad, 2011).

On the other hand, the subjective financial management ability question followed all of the financial behavior and money management questions and so could have been influenced by the answers respondents provided to the earlier questions. In other words, if the respondent had a good feeling about their financial situation after answering the behavior and money management questions positively, then the respondent might have had a higher opinion of their management ability than someone who did not. In the future, the order of the questions in the questionnaire could be randomized to address this issue. It also may be useful to ask the subjective financial management ability question at the beginning of the survey as well as at the end to examine any influence of the series of behavior and money management questions on the respondents' assessment of subjective financial management ability.

The five questions used to analyze objective financial knowledge, although widely used, are somewhat narrow in scope. They covered such topics as growth from compound interest, inflation, diversification of mutual funds versus stocks, mortgages, and bond prices. The objective financial knowledge questions did not include, for example, questions about the understanding of insurance, the management of credit, or the time value of money. Knoll and Houts (2012) indicated that a more robust set of questions may provide a better indication of objective financial knowledge.

There also are issues with the questions used to measure financial behavior. All of the long-term behavior questions deal with retirement planning in some way. Although important, retirement planning is only one of the many long-term financial behaviors one might study. A more valid measure might be behaviors that are more relevant to every age group or a mix of behaviors that includes behaviors relevant to each age group.

There also are important limitations related to the measure of short-term financial behaviors. In particular, it is difficult to understand how respondents interpreted the question, "Do you [or your spouse] overdraw your checking account occasionally?" Presumably, someone who never overdraws would answer "no," but how would someone who overdraws regularly respond?

Continued study in the field of financial literacy is critical to understanding financial behavior and to develop appropriate educational interventions (Schuchardt et al., 2009). To gain a better understanding of the progressions a consumer goes through in a lifetime, a longitudinal study would be ideal.

In addition to objective knowledge and confidence, ability to manage finances represents an important component of financial literacy in Huston's (2010) model. A robust measure of actual ability, objectively assessed, would complement the subjectively assessed financial management ability in this study. An example of a practical tool to measure ability is testing understanding of appropriate actions in response to a bank statement or a credit card statement. Indeed, Knoll and Houts (2012) suggested that the knowledge measure they created be used in conjunction with another tool measuring financial management and skill use. In the field of health literacy, researchers Weiss et al. (2005) presented a brief assessment for medical staff to use to evaluate patient health literacy. The patient was given a nutrition label and asked to answer specific questions. This concept has great potential in the financial literacy field.

The findings here support the section of the conceptual framework which focused on financial literacy and financial behaviors. Further research of interest may look into how these behaviors affect financial well-being and how financial education affects financial literacy and ultimately financial well-being—each with a specific look at age groups. In addition, a time horizon variable or some of the "other influences" included in the model would add to the analysis. These would further substantiate the conceptual framework and its usefulness in financial literacy policy, education, and research as well as meeting the needs of consumers of various ages.

Last, young adults moving back in with their parents have created a shift in our society that likely will influence in their financial futures. Perhaps, when young adults do begin their independent financial life, they will be better prepared with savings accumulated during the period they lived with parents. Or, perhaps they will have merely delayed the inevitable, and when they do begin to make independent financial decisions, they will be disadvantaged if they no longer have their parents' counsel. This study did not control for the housing situation of the respondents; however, such an analysis may produce interesting results.

This article has addressed a gap in research. No previous study has addressed a research question regarding both objectively and subjectively assessed financial knowledge and subjectively assessed financial management ability as associated with financial behaviors in an analysis of age groups. Understanding how each of these varies by age group will give researchers, educators, and policy makers a fresh perspective on financial literacy and its influence on financial behaviors that will help guide future research, curriculum, and policy for consumers of various ages.

Implications

Policy makers should consider a tailored approach to handling financial issues by age group. A one-size-fits-all approach is not ideal to meet the needs of Americans of various ages (Lusardi, Mitchell, & Curto, 2009). Policy makers should support educational initiatives that reach out to various age groups, meeting the needs of a varied consumer population in ways that sweeping regulatory policy cannot.

Tailored educational initiatives may incorporate the following findings. The strong and positive relationship of objective financial knowledge with long-term behaviors in the older age groups suggest that experience with finances supports a better understanding of financial matters. In this case, the older age groups likely have had experience with retirement planning and investing. Educators should consider methods to deliver financial education that provides experience, in addition to knowledge and information, in an environment where mistakes will not have lasting effects. This is especially important for the younger age groups. According to Shim et al. (2013), the younger age groups have experience with short-term financial behaviors such as saving, budgeting, and spending. Findings here indicate a higher confidence level for short-term behaviors in the younger age groups which seems to support the findings by Shim et al. Financial education delivery for the student or the young adult can be achieved through simulations of real world financial decisions, with feedback to the students about their choices. For example, the Junior Achievement organization recently launched a business simulation project for youth in Georgia (Thomas-Aguilar, 2013). Something similar with a specific focus on personal financial management would be ideal to give students both experience and knowledge regarding long-term saving, investing, and planning in addition to their experiences with spending and budgeting.

In addition to experience, the results revealed the importance of confidence. In the younger cohorts, subjective knowledge, or level of confidence in one's financial knowledge, was associated with positive financial behavior. Increasing an individual's confidence level in the management of finances may play an important role in changing behavior. In the work by Bandura and Schunk (1981), children

increased their level of confidence in math via a curriculum based in self-directed learning. This method of instruction also increased the student's level of self-knowledge of capabilities. In other words, not only was the student more confident in his or her abilities but also better able to accurately assess his or her level of knowledge. In addition, this method of instruction increased the students' intrinsic interest in math, which addresses a concern reported by Mandell and Klein (2007) that young adults' lack of financial knowledge may be related to a lack of interest in financial matters.

In general, challenges exist in reaching individuals with information, knowledge, or experience based on their particular situation. Understanding that knowledge increase is associated with experience with finances and identifying the self-confidence of the younger age groups is important. Braunstein and Welch (2002) explained the value of understanding the intended audience for financial literacy programs; indeed, they emphasized the "who, what, when, where, and how" to design and deliver financial literacy education. For example, when is the appropriate time to expose individuals to general and specific financial topics, where is the best location to reach the broadest audience, and how can a curriculum be delivered over time to best assist consumers and their current circumstances? The use of age group differences to answer these questions provides a targeted, age-appropriate approach.

For the financial advisor, much of the same individualized approach to clients is recommended. Understanding that the young adult has more experience and confidence with the short-term financial decisions can create an opportunity for an advisor to explain and educate clients on the importance of long-term investment and saving decisions. Likewise, understanding that their older clientele have knowledge that is based on experience with financial products may help them discuss existing retirement plans and long-term investments.

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