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ORIGINAL RESEARCH

Comparing Financial Socialization and Formal Financial Education: Building Financial Capability

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Abstract
Many individuals learn financial knowledge and skills in school (namely formal financial education) and through friends and family (e.g., family financial socialization). While the two channels have distinctive merits and limitations, little is known about how formal financial education and family financial socialization differ and interact when it comes to helping people gain financial knowledge and skills. Using data from the 2015 National Financial Capability Study, we examined the association between formal financial education, family financial socialization, and financial knowledge. Results from regression estimates with interaction terms included indicated that both channels had positive associations with increased financial knowledge levels with different impact magnitudes, while together they seemed to have negative associations with increased financial knowledge. Our study suggests that each channel likely provides financial knowledge in different domains and has implications for future research and financial education policy.

Keywords Financial socialization · Financial education · Financial knowledge · Interaction · Financial capability

1 Introduction

As people's lives have become increasingly financialized in the past 2 decades (Sherraden 2013), financial knowledge and skills that are essential to making sound financial decisions have received mounting attention (Hastings et al. 2013). It has been recognized that a lack of financial knowledge can result in poor financial choices that are detrimental to the well-being of individuals and communities (Braunstein and Welch 2002). In fact, empirical studies undertaken in the United States, Canada, Britain, and Australia have shown a consistent association between low financial literacy and uninformed financial behaviors (Marcolin and Abraham 2006; Sebstad and Cohen 2003). Prior research converges to indicate that the general public in the United States is not well informed about basic financial

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concepts and is at risk of making unsound financial decisions (e.g., Hilgert et al. 2003; Lusardi 2013; Lusardi and Mitchell 2014). Given this observed relationship, there is a growing interest in identifying strategies that promote financial knowledge and transform newly acquired knowledge into changed behaviors with the hope of facilitating positive financial outcomes.

Financial capability is a broad term that refers to financial knowledge, skills, values, attitudes, as well as access to financial products and services that foster financial security (Sherraden 2013). The focus of this paper on financial knowledge and access to financial education opportunities are essential to better financial capability. There are three external channels through which people gain knowledge about financial matters: financial socialization, financial education, and professional financial guidance (Sherraden 2013). Specifically, financial socialization refers to a process in which people learn about financial knowledge, skills, and attitudes from their environment (e.g., from family, friends, peers, and social networks) (Ward 1974). For instance, children and teenagers observe and acquire attitudes, knowledge, and skills relating to financial matters from families and peers as they enter into adulthood (Sherraden 2013). Financial education, on the other hand, often refers to programs or intervention processes by which individuals improve their understanding of financial concepts and products and develop the skills and confidence (Organization for Economic Co-operation and Development 2005). In addition, people also seek financial advice and guidance from professional financial counselors and planners to deal with financial problems and plan for future security. Not everyone has access to professional financial guidance due to its fee-based nature (Sherraden 2013). However, financial socialization and formal financial education are rather readily available: Individuals experience financial socialization throughout their lives, and financial education is reasonably accessible in many public schools in the United States. Despite the mounting interest in identifying optimal strategies for equipping individuals with financial management skills, though, a substantial knowledge gap remains on the topic of whether and how the two channels differ in terms of influencing financial knowledge and behaviors (Sherraden 2013). Studies on each channel and its possible effects on financial knowledge are abundant, yet few have examined the two together. This is partly because financial education at school and at home have been often considered to be isolated activities (Van Campenhout 2015). Recently however, an increasing number of financial education interventions at schools have incorporated parental involvement in program designs (Van Campenhout 2015). Nevertheless, what remains unknown is how formal financial education and family financial socialization differ and interact when it comes to building financial knowledge and capability. This paper aims to explore the association between differences in access to financial education and financial knowledge levels using a nationally representative sample. While unable to determine causality due to the cross-sectional nature of the data, this exploratory study is the first known research comparing the strength of associations between formal financial education, financial socialization, and financial knowledge.

1.1 Literature Review

1.1.1 School-Based Financial Education

Over the past decade there has been a notable increase in the development and delivery of financial education programs (Collins and O'Rourke 2010). These financial education initiatives are often delivered via a partnership among various stakeholders and vary by setting,

target audience, and subject matter. As the number of financial education programs has increased and expanded across the United States in the last few decades, a notable number have targeted school-age children, teenagers, and college students. Secondary and post-secondary classrooms are considered important avenues for developing financial knowledge, while many middle schools and high schools have integrated financial education into their school curricula (Mandell 2006). In fact, financial education has become a public policy tool when states incorporate personal finance standards into their state education system and explicitly require that the standards be implemented. There are currently 24 states requiring that high schools offer a course in economics and 19 states requiring a course in personal finance (Council for Economic Education 2016). Mandated financial education in schools is often carried out in a lecture format given in the classroom or online and typically takes one semester to complete (Mandell 2006). Findings from evaluation studies on school-based financial education are mixed, with most evaluations suggesting that such programs are effective in improving students' financial knowledge, behaviors, and positive attitudes toward money (e.g., Danes and Haberman n.d.; Bernheim et al. 2001; Urban et al. 2015). Conversely, a few studies have found that high school students who took a semester-long course in personal finance were no more financially literate than those who were not given the education, suggesting that financial education had only a limited impact (e.g., Mandell and Klein 2009). More recently, Harvey (2018) examined the effects of state-mandated financial education on young adults' financial behaviors and indicated that economically vulnerable groups were more likely to benefit in regard to their debt-related outcomes.

1.1.2 Workplace-Based Financial Education

Workplace-based financial education has also gained popularity in recent years as the responsibility for retirement planning shifts from employers to employees (Lusardi and Mitchell 2007). For adult learners adapting to a changing retirement system, a common source of information is education programs provided through employment. Approximately 75% of the corporations surveyed in one study reported providing financial education to employees through financial counseling, workshops, or newsletters (Todd 2002). Workplace financial education materials often cover topics such as asset allocation, retirement planning, budgeting, and investment (Bernheim and Garrett 2003). Most workplace financial education is designed to improve employees' financial knowledge, encourage participation in retirement planning and savings for retirement, and increase workplace satisfaction. Existing evaluation research has provided inconclusive evidence that financial education achieves the intended goals. Some studies have shown that employer-based financial education stimulates savings in general and saving for retirement (e.g., Bernheim and Garrett 2003; Bernheim et al. 2001), while others have found that the overall impact on retirement plan participation was small (e.g., Duflo and Saez 2003).

A review of the literature suggests that the majority of financial education evaluation studies have shown desired outcomes, such as increased financial knowledge and positive financial behaviors in study participants (e.g., Cole et al. 2011; Batty et al. 2015). There is also evidence suggesting a complex relationship between financial education and certain desired behaviors. For example, Clancy et al. (2001) demonstrated that a few hours of general financial education increased savings, but the positive effects diminished as the length of the intervention increased. Similarly, Cole et al. (2011) found that financial education had only modest effects. In fact, recent meta-analyses have indicated that the effects of

financial education interventions are rather limited and tend to be alarmingly small (Fernandes et al. 2014; Miller et al. 2014).

1.1.3 Financial Socialization

While financial literacy research focuses primarily on identifying financial knowledge deficiencies and assessing the effectiveness of financial education approaches, mounting attention has been paid to understanding the role of family context in shaping attitudes, beliefs, norms, and skills related to money management (Gudmunson and Danes 2011; Kim and Chatterjee 2013; Shim et al. 2009; Tang 2017). Parents and guardians are the primary socialization agents for their children as they develop financial knowledge, skills, and attitudes (Danes and Haberman 2007). Indeed, numerous studies have linked parental influence to individuals' values, attitudes, and practices and skills in financial management (Kasman et al. 2018). Families have a multifaceted, complex role in the financial socialization realm, and purposive financial socialization exerts substantial influence on financial knowledge and behaviors (Gudmunson and Danes 2011). According to Gudmunson and Danes (2011), purposive financial socialization refers to a process in which family members make intentional efforts to financially socialize each other. Often, parents encourage children to learn financial knowledge and behaviors by purposive teaching (Beutler and Dickson 2008). Children who have discussion and direct communication with their parents are likely to engage in financial practice (Xiao et al. 2011). While financial socialization can be bidirectional, most studies on financial socialization focus on parental influence in socializing children on financial knowledge and behaviors (e.g., Jorgensen and Savla 2010; Kim and Chatterjee 2013; Tang 2017; Xiao et al. 2011). Studies have found that parental influence has a substantial impact on children's financial knowledge, behavior, and attitudes throughout the life course (e.g., Shim et al. 2009; Sohn et al. 2012).

1.1.4 Summary

A review of the literature on financial education and financial socialization suggests that financial education from schools or workplaces and family processes likely exert a joint influence on people's financial knowledge and behaviors. However, few studies have considered both financial education and financial socialization when examining financial literacy. For example, financial literacy studies have not routinely examined the role of parents, despite research having long suggested that parents play an important role in children's financial literacy. Literature on financial socialization focuses exclusively on parenting style and family interaction in relation to children's financial attitudes and behaviors. Only a few studies explored the joint influence of financial socialization and financial education. For example, in testing a conceptual financial socialization model, Shim et al. (2010) found the role played by parents to be substantially greater than the role played by work experience and high school financial education in predicting college students' financial knowledge and behaviors. The new emphasis on joint influence is also reflected in recent financial education programming. Several financial literacy and inclusion programs have started incorporating program designs that increase parental involvement, illustrating the optimal role of parents in children's learning experiences in financial education programs (Van Campenhout 2015). Despite increasing scholarly interest, little is known about the relationship between formal financial education, financial socialization, and financial knowledge. There is a substantial lack of knowledge

about how formal financial education and financial socialization differ, if at all, in their influence on individuals' financial knowledge and financial outcomes. Understanding ways that financial socialization and formal education individually and jointly affect people's knowledge may yield implications for the design and implementation of financial literacy interventions. To that end, in this paper, we explicitly examine the disparate impact of financial socialization versus formal financial education on people's financial knowledge.

2 Method

2.1 Data

The survey data used for this study was drawn from the 2015 National Financial Capability Study (NFCS), a nationally representative survey of American adults' financial activities, knowledge, attitudes, and behaviors. The NFCS was initially commissioned in 2009 by the FINRA Investor Education Foundation in collaboration with the U.S. Department of the Treasury and the President's Advisory Council on Financial Literacy, and it was conducted by Applied Research and Consulting LLC. The NFCS consists of three separate but related surveys that are administered online, including a national, state, and military questionnaire (FINRA Investor Education Foundation 2015). The questionnaire is designed by Professor Annamaria Lusardi, Applied Research & Consulting LLC, the Office of Financial Education of the U.S. Department of the Treasury Department, and the FINRA Investor Education Foundation (Applied Research & Consulting LLC 2009). The current study used data from the 2015 state-by-state survey, the largest data set of the three. Data were collected using non-probability quota sampling methods to select prospective respondents from three established online panels composed of millions of individuals who were recruited to join online and offered incentives in exchange for their participation (FINRA Investor Education Foundation 2015). The sample size of the 2015 NCFS data set consisted of 27,564 participants, representing approximately 500 adult respondents per state (plus the District of Columbia), who completed the survey online between July 2015 and October 2015.

2.2 Measures

2.2.1 Dependent Variables

One dependent variable in this study was objective financial knowledge. It was measured by six questions designed to assess knowledge of saving interest rate, inflation, borrowing interest rate, bond price, mortgage, and risk diversification. Three questions were multiple-choice questions, and three were true/false questions. All correct responses were coded as 1, and incorrect responses and all other responses (i.e., "don't know" and "prefer not to say") were coded as 0. An overall financial knowledge measure was computed by summing all correct answers, with scores ranging from 0 to 6 and higher scores indicating higher levels of financial knowledge. Subjective financial knowledge was another dependent variable. It was measured on a single-item, self-assessed, 7-point Likert scale, with higher points indicating higher levels of confidence of financial knowledge.

2.2.2 Independent Variables

Independent variables in the study were formal financial education and family financial socialization. Formal financial education was measured by a question asking if any financial education was offered by either schools or workplaces. Respondents were given options such as "offered but not attended," "attended," "no," "don't know," and "prefer not to say." For those who responded "yes," sources of financial education were further asked about, and participants were given optional responses such as "high school," "college," "employer," and "military." Receiving financial education at high school and college was categorized as school-based financial education, while receiving financial education at employer or military was categorized as workplace-based financial education. Financial socialization was another independent variable of this study. It was measured by a question asking whether respondents' parents or guardians had taught them how to manage their finances. For all the above questions, the responses of "yes" and "no" were coded as 0 and 1, respectively, while "do not know" and "prefer not to say" were coded as missing.

Control variables of the study included respondent's age, gender, race, education, marital status, dependent children, and annual household income. As financial education was not offered randomly and might bias the estimation, a variable was created to capture the status of "financial education offered but not attended" and added to the models to help correct the bias.

2.3 Analytical Approach

Descriptive statistics and bivariate analyses were used to describe the sample characteristics and the levels of objective and subjective financial knowledge. Multivariate analyses were employed to examine the association between key independent variables (i.e., formal financial education and family financial socialization) and dependent variables (i.e., objective and subjective financial knowledge) while accounting for control variables. Interaction terms among school-based financial education, workplace-based financial education, and financial socialization were added to test the possible joint effects. Ordered logistic regressions were used to estimate the correlation of formal financial education and financial socialization with financial knowledge. Negative binomial regression and Poisson regression models were estimated to check the robustness of the findings (results are available upon request). Logistic regressions were used to test the effects of financial education and socialization on the correct response to each objective financial knowledge question.

3 Results

Sample characteristics are shown in Table 1. The sample was rather evenly distributed in terms of age and presence or absence of financially dependent children. Female respondents were about 10% more than male respondents. Most respondents (72.25% of the sample) identified themselves as white; about 25% of the respondents had a level of educational attainment of high school, GED, or below; and 38.25% of the sample were single. Regarding household income, the mode of the sample is at least $50,000 but less

Table 1 Sample participant characteristics

	Percent
Sex	
Male	44.8
Female	55.2
Age	
18–24	10.9
25–34	18.2
35–44	16.6
45–54	18.2
55–64	17.6
65+	18.5
Race	
White alone (1)	72.3
Nonwhite (0)	27.8
Education	
High school/less	23.7
Associate degree/some college	39.3
Bachelor/more	37.1
Marital status	
Married/living with partner	61.8
Single	38.3
Financially dependent children	
No child	33.7
No financially dependent children	36.8
Yes	29.5
Household annual income	
< $15,000	11.0
≥ $15,000 but < $25,000	10.7
≥ $25,000 but < $35,000	10.7
≥ $35,000 but < $50,000	14.7
≥ $50,000 but < $75,000	20.7
≥ $75,000 but < $100,000	13.8
≥ $100,000 but < $150,000	12.5
≥ $150,000	6.0

than $75,000 also where the median of household income locates according to a report issued by the Census Bureau of the U.S. (Posey 2016). The respondents with household annual income above $150,000 were the fewest.

Descriptive statistics in Table 2 showed that less than a third (29.41%) of the respondents gave correct responses to more than a half of the six questions, and 25.23% answered one or no question correctly. The mortgage question had the highest percentage of correct responses (79.02%), followed by the basic interest question (78.44%), and the inflation rate question (63.32%). The saving and bond question had the lowest percentage of correct answers (30.55%), followed by the compound interest question (35.07%), and the risk diversification question (49.85%). As for subjective financial knowledge, a majority (79.25%) gave themselves a rating of 5 or higher on a 7-point scale.

Table 2 Sample distribution on reported financial education and financial knowledge levels

	No FE (%)	SFE only (%)	WFE only (%)	FS only (%)	SFE and WFE (%)	SFE and FS (%)	WFE and FS (%)	All three (%)
	43.7	5.2	1.2	35.0	2.4	6.8	1.2	4.6
Correct response								
Basic interest	75.8	80.3	86.2	78.7	85.5	84.2	85.5	82.6
Inflation rate	61.4	63.8	82.0	62.1	77.6	67.5	76.9	68.3
Saving and bonds	27.4	31.5	41.0	29.9	46.0	35.0	43.4	44.0
Compound interest	31.5	38.1	42.0	35.2	44.9	41.7	36.7	46.6
Mortgage	76.3	80.6	89.5	79.2	88.3	82.1	87.8	86.6
Risk diversification	45.5	53.5	69.2	49.1	70.0	57.0	62.1	62.8
Number of correct responses to objective FK								
0	10.5	6.8	2.3	8.7	3.0	5.5	3.2	2.6
1	18.5	15.3	7.5	16.5	7.4	14.8	11.6	13.4
2	23.3	22.6	18.4	22.9	18.2	19.5	17.0	18.6
3	22.0	24.1	26.9	23.9	20.7	24.2	27.3	22.0
4	17.8	21.1	25.9	18.8	33.2	23.2	25.1	25.6
5	8.0	10.0	19.0	9.3	17.7	12.9	15.8	17.8
Subjective FK scale								
1	2.1	1.0	0.0	0.7	0.2	0.3	0.0	0.1
2	2.5	1.3	0.3	0.9	0.5	0.3	0.3	0.1
3	6.3	4.1	1.6	3.2	1.6	2.4	1.0	0.3
4	17.2	13.8	12.5	12.4	5.0	9.9	5.1	3.5
5	36.2	35.6	30.2	36.6	25.5	34.1	34.4	20.1
6	25.0	28.5	35.7	32.0	42.6	35.7	37.9	42.1
7	10.7	15.8	19.7	14.3	24.7	17.3	21.2	33.9

FE financial education, *FK* financial knowledge, *FS* financial socialization, *SFE* school-based financial education, *WFE* workplace-based financial education

Nearly half (43.7%) of the sample did not receive any formal financial education or financial socialization. One-fourth were offered formal financial education but chose not to avail themselves of it. Less than a fifth (14.8%) reported receiving financial education via at least two channels, while only 4.6% of the respondents reported receiving financial education via all three channels. Also included in Table 2 is the sample distribution of correct responses to the objective financial knowledge questions as well as the subjective financial knowledge scale.

Listwise deletion was adopted due to limited missing data on variables of interest, resulting in a sample size of 26,094 (94.67% of the original sample) for all multivariate analyses. Table 3 presents the estimates of odds ratios (OR) from ordered logit regressions estimating effects of financial education and financial socialization on objective and subjective financial knowledge, respectively. Models 1 and 3 regressed the control variables, while models 2 and 4 included all the variables. Results showed that respondents with any form of financial education or financial socialization were more likely to give more correct answers to objective financial knowledge questions. Those who had received workplace-based financial education were 81% more likely to give one or more correct answers than those without workplace-based financial education ($OR = 1.81$, $p < .001$). Similar positive associations were found for school-based financial education ($OR = 1.57$, $p < .001$) and financial socialization ($OR = 1.12$, $p < .001$). Almost all interaction items were found to have a statistically negative association with objective financial knowledge. As shown in models 1 and 2, those who were female, white, less educated, or paid less were more likely to have a lower level of objective financial knowledge. Compared with childless participants, participants with financially dependent children had lower levels of objective financial knowledge, and those with adult children had higher levels of objective financial knowledge.

Models 3 and 4 show estimates of variables predicting subjective financial knowledge. Financial education received from either channel was positively associated with subjective financial knowledge ($OR = 1.46$, $p < .001$; $OR = 1.70$, $p < .001$, respectively). No interaction showed a significant relationship with subjective financial knowledge. Control variables showed a similar association with subjective financial knowledge as they did with objective financial knowledge. For example, respondents with less household income were more likely to give themselves a lower rating on the subjective financial knowledge scale than their counterparts. Those who were white or had financially dependent children tended to have a higher level of subjective financial knowledge.

Table 4 shows results from logistic regressions that estimate associations between formal financial education, financial socialization, and specific objective financial knowledge. Findings showed that school-based financial education was positively associated with correct responses to each of the six objective financial knowledge areas examined. The strength of the associations was similar, and the odds ratios ranged from 1.29 to 1.59. Receiving workplace-based financial education was associated with correct answers to all except the compound interest question. Financial socialization was found to be positively associated with correct responses to all but the inflation question, but the odds ratios were smaller than the odds ratios of school-based and workplace-based financial education.

As for interaction terms, the interaction between school-based financial education and financial socialization showed no association with the objective financial knowledge examined. The interaction between school-based and workplace-based financial education was negatively associated with the knowledge of basic interest, inflation, mortgage, and risk diversification. The interaction between workplace-based financial education and financial socialization was negatively associated with the knowledge of basic interest, inflation,

Table 3 Ordered logit model for predicting objective and subjective financial knowledge

Variables	Objective FK (OR)		Subjective FK (OR)	
	Model 1	Model 2	Model 3	Model 4
Female	.51***	.52***	.70***	.73***
White	.63***	.62***	1.11*	1.13**
Age (35–44 as reference)				
18–24	.82**	.76***	1.04	.90*
25–34	.73***	.71***	1.08	1.04
45–54	1.35***	1.35***	1.01	.99
55–64	1.70***	1.71***	1.32***	1.34***
≥ 65	2.04***	2.05***	1.96***	2.00***
Educational level (associate degree/some college as reference)				
High school and below	.55***	.58***	.89**	.99
Bachelor and above	1.97***	1.93***	1.24***	1.16***
Married or living with partner	1.02	1.03	1.02	1.03
Children (no child as reference)				
Has financially dependent children	.93*	.93*	1.34***	1.33***
No financially dependent children	1.14**	1.13**	1.25***	1.25***
Annual household income ($50–75 K as reference)				
< $15 K	.49***	.50***	.48***	.49***
$15–25 K	.57***	.57***	.65***	.65***
$25–35 K	.67***	.68***	.82***	.84***
$35–50 K	.82***	.83***	.91*	.93
$75–100 K	1.08	1.07	1.20***	1.16***
$100–150 K	1.58***	1.56***	1.29***	1.24***
> $150 K	1.97***	1.95***	1.63***	1.55***
Received FE	.91	1.01	1.46***	1.70***
Received SFE	–	1.57***	–	1.72***

Table 3 (continued)

Variables	Objective FK (OR)		Subjective FK (OR)	
	Model 1	Model 2	Model 3	Model 4
Received WFE	–	1.81***	–	1.64***
Received FS	–	1.12***	–	1.65***
SFE * WFE	–	.66***	–	.99
SFE * FS	–	.98	–	.93
WFE * FS	–	.70***	–	1.10
Model statistics	Wald χ^2 (20) = 5846.41*** Pseudo R^2 = 0.077	Wald χ^2 (26) = 8203.88*** Pseudo R^2 = 0.080	Wald χ^2 (20) = 3079.17*** Pseudo R^2 = 0.029	Wald χ^2 (26) = 7871.24*** Pseudo R^2 = 0.045

OR odds ratio, *FE* financial education, *FS* financial socialization, *SFE* school-based financial education, *WFE* workplace-based financial education

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

Table 4 Logistic regression for estimating associations between financial education, financial socialization, and objective financial knowledge

	Basic interest (OR)	Inflation (OR)	Saving and bonds (OR)	Compound interest (OR)	Mortgage (OR)	Risk diversification (OR)
SFE	1.29*	1.33***	1.33***	1.30***	1.59***	1.46***
WFE	1.84***	2.38***	1.41***	1.08	1.68***	1.80***
FS	1.10*	1.01	1.10*	1.12***	1.12**	1.07*
SFE * WFE	.54***	.46***	.77	1.07	.71*	.70**
SFE * FS	1.06	1.03	1.00	.98	.89	.98
WFE * FS	.69**	.57***	.95	.88	.81	.66***

OR odds ratio, *FS* financial socialization, *SFE* school-based financial education, *WFE* workplace-based financial education

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

and risk diversification. Findings on the relationship between control variables and specific knowledge were similar to the findings in models 1 and 2. Therefore, they were not included in the table (detailed information is available upon request).

4 Discussion and Implications

Consistent with findings from past studies (e.g., Urban et al. 2015), we found formal financial education was positively associated with both objective and subjective financial knowledge. Regarding effect size, findings suggest that in comparison with receiving school-based financial education, receiving workplace financial education had a stronger association with objective financial knowledge. This may be because workplace-based financial education often delivers specific financial knowledge such as retirement planning and investment, which overlapped with the knowledge tested in this study (e.g., interest on savings, inflation, bond prices, and risk diversification). It is possible that participants who received workplace financial education were more knowledgeable on the normative financial knowledge examined in this study. In addition, workplace financial education occurs at the stage of life in which individuals are working and likely in a position to conduct financial planning for long-term goals. The timing is conducive for individuals to apply newly gained knowledge to their financial activities, which in turn reinforces their financial knowledge (Fernandes et al. 2014). Compared to socioeconomic factors, each of the financial education channels examined in this study (school-based education, workplace-based education, and financial socialization) showed a rather large association with objective knowledge. This finding implies that financial education has the potential to address financial knowledge deficiencies for all individuals regardless of their socioeconomic background.

Our finding that family financial socialization had a positive association with objective financial knowledge as well as subjective financial knowledge underscores the importance of the family context in shaping people's financial knowledge, confidence, and attitudes regarding money management. Interestingly, financial socialization had a rather large positive impact on subjective knowledge, suggesting that parental factors play a prominent role in shaping people's confidence and perceived knowledge of financial matters. This finding

corroborates with past studies showing that parents are the key influence in children's lives as they grow up and continue to influence the financial socialization of their children when they are adults (e.g., Jorgensen and Savla 2010).

Furthermore, our findings suggest that financial socialization is likely to have an impact on a specific domain of financial capability (i.e., confidence). This has important policy implications, as the literature indicates that attitude, confidence, and values are key determinants of financial literacy and sound financial decision making (Chen and Lemieux 2016; Von Stumm et al. 2013). Our findings suggest that policy support for family-based financial education interventions should be encouraged, and specific strategies should be developed to assess and address financial confidence, attitudes, and values. Overall, our findings highlight the importance of assessing family environment and parental influence when evaluating individuals' financial knowledge and skills. To better understand a person's financial knowledge and skills, practitioners should adopt the person-in-environment perspective and collect information on financial attitudes and behaviors of parents, peers, and others in individuals' social circles.

Findings on the interaction terms showed complex relationships between formal financial education, financial socialization, and financial knowledge. First, the interaction of school-based financial education and financial socialization showed no significant relationship with objective financial knowledge. We speculate that this finding may have to do with the nature of the knowledge delivered through each channel. The financial knowledge assessed in this study was more or less about basic economic principles, which is unlikely to be the knowledge that individuals often gain from financial socialization. Future research is clearly needed to assess a broader range of financial knowledge and examine how each financial education channel affects different domains of financial knowledge. Our findings also showed that when workplace financial education interacted with either school-based financial education or financial socialization, the coefficients were either nonsignificant or negative in relation to objective financial knowledge. This may also be because knowledge and skills gained from various sources have a distinctive nature and may possibly drive a person's knowledge level in different directions. For example, conventional wisdom about money garnered through financial socialization can be in conflict with normative knowledge gained through school-based financial education. More research is warranted to understand these perplexing relationships.

4.1 Limitations

This study has several limitations. Our analyses of formal financial education were only rough estimates because of the great variation in financial education programs in school and workplace settings, and data on dosage of financial education were unavailable. In addition, because of the cross-sectional research design of one wave of NFCS data, findings about the relationships between financial education or socialization and financial knowledge are correlational at best. In fact, selection bias is likely abundant in this study, as study participants who had access to formal financial education and took the opportunity to learn may be very different from those who did not have access to or receive formal financial education. Measurement issues are also a concern. While financial socialization can occur via family members, friends, peers, and colleagues, it was measured with only one item assessing parents and guardians as providers of socialization in this study. Broader definitions should be adopted in future research in order to assess financial socialization with better accuracy. In addition, financial knowledge was assessed with only six

questions, so the study measures are also likely subject to weak content validity. Another limitation is the weak power of generalization due to the fact that the NFCS data were collected through online panels with low response rates.

4.2 Conclusions

This study examined two main financial education approaches and compared their relationships to levels of objective and subjective financial knowledge. Our findings suggest that financial socialization influences not only objective knowledge but also confidence, an important component of financial capability. It suggests that parents and the family environment should be considered in financial education intervention efforts to improve financial knowledge. Findings on the interaction terms imply that knowledge gained from different sources may not be complementary. Thus more research is needed to examine a broader range of financial knowledge and whether and how each knowledge delivery channel affects the different domains of financial knowledge.

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