The Relationship Between Financial Education in Young Adults and Financial Literacy: A Review of the Literature in Canada and the United States*

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ABSTRACT

Professional accounting bodies in Canada and the United States, and throughout the world, have funded programs to improve financial literacy for many years. This ongoing interest stems from the expected benefits of improved financial behavior for individuals, society, and financial markets. However, the fact that relatively little research on financial literacy has been published in accounting journals suggests that few accounting academics are aware of, interested in, or motivated to work on the topic. This review helps to identify what we know about the effectiveness of financial education programs intended specifically for young adults, who constitute the demographic group likely to gain the most from improved financial literacy. Our review identifies factors that impinge both on the effectiveness of financial education programs and the research examining these programs. Noteworthy factors include (1) a lack of theoretical frameworks to guide the programs and research on the programs, (2) a tendency for outcome measures to capture financial knowledge rather than financial behaviors, and (3) the need for stronger research designs. We also note some possible instructional design considerations in developing financial education programs and highlight financial literacy as a promising area of research for accounting academics. Our findings can help guide improvements to financial education programs and encourage further research to assess the effectiveness of financial literacy programs.

Keywords: financial education, financial knowledge, financial literacy, literature review, young adults

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LA RELATION ENTRE L'ÉDUCATION FINANCIÈRE CHEZ LES JEUNES ADULTES ET LA LITTÉRATIE FINANCIÈRE : EXAMEN DE LA LITTÉRATURE AU CANADA ET AUX ÉTATS-UNIS

RÉSUMÉ

Pendant de nombreuses années, les organismes comptables professionnels au Canada, aux États-Unis et ailleurs dans le monde ont financé des programmes pour accroître la littératie financière. Cet intérêt soutenu est attribuable aux avantages attendus associés à une amélioration du comportement financier des particuliers, au sein de la société et dans les marchés financiers. Toutefois, la quantité relativement faible d'études sur la littératie financière qui ont été publiées dans des revues comptables donne à penser que peu de chercheurs en comptabilité sont conscients de cet enjeu, ou encore intéressés ou motivés à y travailler. Le présent examen contribue à déterminer ce que nous savons à propos de l'efficacité des programmes d'éducation financière ciblant spécifiquement les jeunes adultes, lesquels représentent le groupe démographique le plus susceptible de tirer profit d'une meilleure littératie financière. Notre examen cerne des facteurs qui nuisent à la fois à l'efficacité des programmes d'éducation financière et à la recherche qui se penche sur ces programmes, notamment 1) l'absence de cadres théoriques pour orienter les programmes et la recherche s'y rapportant, 2) une tendance à mesurer les résultats pour refléter des connaissances financières plutôt que des comportements financiers et 3) des plans de recherche qui auraient besoin d'être plus solides. Nous présentons également certains éléments de conception pédagogique à prendre en compte aux fins de la mise sur pied de programmes d'éducation financière et avançons que la littératie financière est un secteur de recherche prometteur pour les universitaires du domaine de la comptabilité. Nos observations peuvent contribuer à orienter les améliorations à apporter aux programmes d'éducation financière et encourager d'autres chercheurs à évaluer l'efficacité des programmes de littératie financière.

Mots-clés : connaissances financières, éducation financière, examen de la littérature, jeunes adultes, littératie financière

INTRODUCTION

The 2007–2008 financial crisis and recent global pandemic appear to have renewed the interest of governments and policy-makers in financial literacy. There are broad national economic implications of citizens' poor financial knowledge and decision-making, as well as significant consequences for the global economy (Financial Consumer Agency of Canada [FCAC], 2023). In September 2023, the Ontario Securities Commission (OSC) relaunched an expanded GetSmarterAboutMoney.ca, offering educational resources related to investing, budgeting, retirement, and more. This initiative aligns with their mission to protect "investors from unfair, improper or fraudulent practices (and) to foster fair, efficient and competitive capital markets (as well as) confidence in the capital markets" (OSC, 2023). Boisclair et al. (2017) note the relationship between financial literacy and retirement planning, a topic of importance to the federal government as it creates policy related to the Canadian Pension Plan, Registered Retirement Savings Plans, and Tax-Free Savings Accounts. Individuals' ability

to purchase or rent homes, plan for retirement, and pay for education is improved by having knowledge of effective practices related to managing savings, spending, debt, insurance, retirement planning, and other important personal financial behaviors (Lusardi, 2007).

Importantly, financial literacy includes both the possession of financial knowledge and the ability to exhibit sound financial behavior (Lusardi & Mitchell, 2014). An effective financial education program thus should provide a means of improving financial literacy through the acquisition of financial knowledge as well as strategies to change future behaviors (OECD, 2005).

Policy-makers are especially concerned about the financial literacy of young adults, as many appear to lack the basic knowledge needed to make good financial decisions (e.g., CPA Canada, 2021; Mandell, 2008). The Canadian Financial Capability Survey (FCAC, 2019) found that for Canadians aged 18–34, only 56% reported engaging in any kind of financial learning, and of these, the majority reported no subsequent improvement in understanding of debt, ability to create and maintain a budget, or knowledge about how to achieve savings goals. A US survey that assesses financial literacy with questions concerning common financial situations found fewer than 46% were answered correctly by young adults versus 54% answered correctly by those over 60 (Yakoboski et al. 2022). While inadequate income is likely to contribute to the economic problems of young adults, lack of financial literacy compounds the effects of limited income. The OECD also found that while young adults in Canada and the United States had improved their performance in financial literacy tests relative to prior periods, they continue to underperform relative to many of their OECD counterparts (OECD, 2020). Other recent findings demonstrate that young adults in the United States are increasing their debt levels and continue to rate poorly on various measures of financial literacy (Boisclair et al., 2017; Bolognesi et al., 2020). Addressing and improving this situation seems particularly important in both Canada and the United States.

A variety of financial education programs have been initiated in Canada and the United States to address the ongoing concerns with financial literacy in young adults. For example, CPA Canada has an in-person financial literacy program that was originally launched in 2013. This program provides training on basic personal financial topics such as budgeting, saving for future expenses, managing expenditures, obtaining loans, utilizing credit cards, and exploring personal insurance options (CPA Canada, 2021). The AICPA has a similar program to improve financial literacy called "360 Degrees of Financial Literacy" (AICPA, n.d.). In August 2021, FCAC, a government agency tasked with improving citizens' financial literacy and understanding of the financial sector, released a new national financial literacy strategy (FCAC, 2021). Provincial governments throughout Canada have mandated financial literacy education for students starting in elementary schools. Two notable examples of such initiatives include the following:

1. The Ontario Ministry of Education's (2013) financial literacy education initiative, launched in 2013 for students in Grades 4–12. The program is incorporated into the school curriculum and exposes students to basic financial concepts.
2. The Government of Alberta (2022) announced $5 million in new funding, intended in part to develop and implement financial literacy programs for children in Grades 3–12.

In the United States, the Financial Literacy and Education Commission (FLEC) develops national strategies for financial education. This commission plays a central role in the US government's efforts to enhance financial literacy, financial capability, and individual financial well-being for American students (FLEC, 2016).

There have been hundreds of published studies examining the effect of financial education programs on financial knowledge, with some of these also examining financial behavior. Most of these studies rely on either self-reported improvement in knowledge or results from tests of financial knowledge included as part of the financial education programs. Many of the studies do find improvements in financial knowledge based on these outcomes. However, meta-analyses of the effect of financial education programs on financial literacy have found mixed evidence of long-term retention of such knowledge or positive financial behavioral changes associated with the improvements noted (Fernandes et al., 2014; Kaiser & Menkhoff, 2017). Other literature reviews (Amagir et al., 2018; McCormick, 2009; Totenhagen et al., 2015) note potential issues with the development of educational programs and assessment of these programs. In our paper, we review recent research on the effectiveness of financial education programs in young adults in the United States and Canada to explore how outcomes from these programs might be improved. We identify potential shortcomings both in the educational programs and in the research designs used to understand the effectiveness of the programs.

We limit the scope of this paper to studies examining the financial education programs for high school and post-secondary students in Canada and the United States since the year 2000. There are two main reasons for this:

1. Improving financial literacy at this age is expected to have lifelong benefits for individuals as well as help alleviate future societal economic difficulties caused by negative financial behaviors in the aggregate.
2. When academics research financial literacy, this group is often more accessible as participants in field and experimental studies.

In our review, we utilize a qualitative analysis framework to explore the effectiveness of financial education programs for improving financial literacy. Academic articles included in our review were selected primarily using database search tools from ABI-INFORM Global, Education Source Complete, and EconLit. This search resulted in 88 studies focusing on financial education programs for young adults in Canada or the United States, which were then included in this review.

Our analysis of these studies leads to four conclusions:

1. Most studies report positive impacts of the financial education programs being studied, but these conclusions are often based on self-reports or improvements in scores from tests administered at the end of the financial education program.
2. Very few financial education programs seem to have employed a conceptual framework to guide the development of their programs, and only five studies in our sample explicitly employ theories to guide their research design. Without some type of underlying theory, program developers may not be designing programs appropriately, and researchers may be failing to appropriately measure key constructs or control for relevant factors when determining the effects of education on financial literacy.
3. Assessment of financial literacy would benefit from studies using research designs that include experiments with controls and more robust analysis. We found that only 12 of the studies (13.6% of the total) used a control group in their experimental design. In addition, most of the studies examined school curriculum-based financial education programs. These studies rarely explained the instructional design of the programs, and it is possible that programs are simply not delivered in a way that is likely to achieve the desired future increase in positive financial behavior.
4. Our review of the literature indicates there are few studies investigating the long-term effects of acquiring financial knowledge. While some studies examined financial behavior after an educational intervention, they often failed to carefully consider factors other than the training that would affect the formation and change of behavior. As stated previously, most studies employed self-report assessments and test scores for their measures of financial literacy. Few, if any, of the studies we reviewed provided convincing evidence on the adequacy of these measurements for evaluating long-term improvements in financial behavior.

Given the interest of accounting professional bodies in financial literacy and the desire of business schools for accreditation and other reasons to demonstrate societal impact, research with the potential to improve financial education programs seems like a promising area for accounting academics.

Our findings can help accounting researchers interested in this area understand the opportunities for future research. For example:

1. Accounting researchers can draw on their existing knowledge of judgment and decision-making to provide better conceptual frameworks and research designs for financial literacy research. Financial literacy research provides an interesting setting to examine budgeting, investing, and tax decisions by nonprofessionals.
2. Accounting researchers can make use of their experience and training in teaching topics like budgeting and tax, and either draw on their own knowledge and skills in teaching or work with education researchers to provide recommendations on financial education program curriculum and design to improve the likelihood of getting the desired changes in behavior.

3. Work in financial literacy could be extended to help understand financial management behaviors of young entrepreneurs, who in many cases have little financial knowledge at the outset of their ventures. Given the importance of entrepreneurship to many economies, more insight into how people who may have little financial background benefit from financial literacy education would be welcome.

The rest of the paper is structured as follows. First, we discuss prior literature reviews of financial literacy to identify broader concerns that have been previously raised about financial education. We then develop our own literature review focused on studies of financial education programs for young adults in Canada and the United States to identify areas of concern, both related to the financial education programs themselves and to the evaluation of these programs. Finally, we provide an overall summary and conclusion.

PRIOR LITERATURE REVIEWS OF FINANCIAL LITERACY

There are several prior reviews of financial literacy and related education programs that provide a broader context for our analysis. Several of these reviews (Amagir et al., 2018; McCormick, 2009; Totenhagen et al., 2015) focus on qualitative assessment of financial education programs developed for children and adolescents. Other reviews (Fernandes et al., 2014; Hastings et al., 2013; Kaiser & Menkhoff, 2017; Lusardi & Mitchell, 2014) examine populations as a whole rather than just children or youth. These tend to take a more economic perspective on financial education, such as exploring cross-sectional variation and considering alternative approaches to improving financial outcomes through means such as government policy.

The work most like our own is that of Amagir et al. (2018), which analyzes peer-reviewed studies of financial education programs for children and adolescents published between 2004 and 2015 across all countries. Amagir et al. find that most studies indicate an improvement in financial knowledge, but in the few studies that examine behavior, they find that educational programs have little effect on actual financial behaviors. They note concerns about knowledge retention and find an emphasis on the short-term effects of education within most studies. In our review, we note similar concerns and then consider how prior studies utilize, or fail to utilize, theoretical frameworks to guide formation and evaluation of educational programs, something that is not specifically addressed by Amagir et al. Our study also helps bring awareness regarding the importance of financial literacy for accounting researchers. The financial behaviors of young adults are and will continue to be important determinants of well-functioning markets and financially healthy populations.

We also build on and extend the findings of Totenhagen et al. (2015) and McCormick (2009). Like Amagir et al. (2018), these authors largely examine the effects of financial education on the financial behavior of children, whereas our focus is on the young adult population. McCormick reviews financial education studies from 2004 to 2008 of youth programs predominantly in the United States and makes several recommendations for ways of improving financial education programs, including ensuring the content is relevant by addressing current contexts such as ATMs, credit cards, and bill

payments; starting programs at an early age; providing teacher training in financial education; and more effectively evaluating actual outcomes. McCormick also identifies some suggestions for future research, including (1) knowing more about the barriers to better financial decisions, (2) developing curricula that involve active learning, (3) evaluating effectiveness of training methods to help teachers, and (4) recommending financial education standards or best practices to governmental bodies with jurisdiction over public education.

Totenhagen et al. (2015) analyze US studies examining financial literacy programs for students in kindergarten to Grade 12 published between 2002 and 2012. Their objective was to determine specific design features and program delivery methods that could improve financial education programs. They note that the majority of youth fail financial literacy tests that require students to respond to specific financial scenarios, even after taking financial education courses. Totenhagen et al. identify eight ways to improve financial education programs: establish standards for financial education and align programs with those standards; involve parents; conduct regular evaluations of the programs; train instructors; begin early and have continual financial education; embrace and incorporate the diversity of backgrounds and needs; align training with the motivation and interests of youth; and identify essential knowledge.

We now examine several literature reviews that, although not specifically focused on young adults, provide a broader economic perspective on the effectiveness of current financial education programs in enhancing financial behaviors. The following four literature reviews are briefly reviewed: Lusardi and Mitchell (2014), Hastings et al. (2013), Kaiser and Menkhoff (2017), and Fernandes et al. (2014).

Lusardi and Mitchell (2014) find that the overall level of financial literacy is low, based on analysis of prior studies that utilized responses to various financial scenarios. They note this suggests a gap between participants' self-reported financial knowledge, which tends to be high, and their ability to apply that knowledge in practical situations. The authors suggest a potential role for regulation to provide more standardized information for financial decision-making, potentially enhancing the effectiveness of financial education efforts. Hastings et al. (2013) echo similar findings, noting a seeming disconnect between self-reported improvement and actual changes in financial behaviors.

Kaiser and Menkhoff (2017) and Fernandes et al. (2014) conduct meta-analyses of prior studies. Kaiser and Menkhoff (2017) find a positive correlation between financial education and financial behavior but observe that those with lower socioeconomic status or those without a salient financial decision are less likely to benefit from financial education programs. Fernandes et al. (2014) additionally find that the positive impact of financial education programs on financial behavior diminishes over time. Both meta-analyses, in line with prior discussions, indicate a more substantial effect of financial education on self-reported financial knowledge improvements than on actual behavioral changes.

These four literature reviews raise questions about the strength of the association between financial education and financial behavior. They identify various possible factors

contributing to these inconsistencies, including the nature of the education programs, income levels of participants, measurement of outcome variables, and the quality of the research designs used to examine the efficacy of the education programs. These reviews underscore the need for further research in this area.

Finally, commissioned academic reports have identified a lack of research on programs to improve the financial literacy of individuals from vulnerable groups (e.g., Robson, 2012; Robson & Loucks, 2018).

Our analysis both builds upon and extends prior reviews in several ways. First, we specifically focus on studying the impact of financial education on young adults in Canada and the United States. We believe that this demographic is most likely to benefit from increased financial literacy. Additionally, this population is relatively accessible to accounting researchers in these regions, providing an opportunity for meaningful research in this area. Second, we delve into the role of theoretical frameworks in guiding both educational programs and the research evaluating these programs. This aspect, not explicitly addressed in most prior literature reviews, adds a valuable dimension to our analysis. Third, while we address issues related to financial education program design, we also highlight aspects of research design that warrant increased attention. Strengthening the validity of research findings in financial literacy requires a comprehensive consideration of both program and research design.

Our aim is to stimulate interest among accounting academics to engage in research related to financial literacy. We encourage leveraging expertise in subjects such as budgeting, the use of behavioral models, and research design to enhance our understanding of the effectiveness of studies in this field.

LITERATURE REVIEW: METHOD AND KEY FINDINGS

Academic articles included in our review were selected primarily from the ABI-INFORM Global, Education Source Complete, and EconLit databases. We restricted our search to the period from 2000 to 2021 and used the words "young adults" and "financial education," along with many of their synonyms, as our search terms.[1] To ensure completeness, we did a secondary search of Web of Science and Google Scholar for articles with the subject of financial literacy, manually reviewing the title and subject for all articles in this secondary search to ascertain appropriateness to our selection of studies. Using this approach, we identified 607 unique academic articles from these combined sources. These 607 papers were then individually reviewed to ensure they were within our scope. Many of these 607 papers related to financial education programs outside of Canada and United States and thus were considered outside of the scope of our review. Others were assessed as outside of our scope because they did not focus on both financial literacy and young adults but only referenced these concepts (e.g., as confounding variables or descriptors within their sample). After removing these out-of-scope studies, we

1. Examples of synonyms used "financial liter*," "personal finance," "money management," "youth," and "university."

were left with 88 studies with a focus on financial education programs of young adults in Canada or the United States from 2000 to 2021.

These studies largely examined specific finance education programs, often provided in school settings. The effect on participants was usually determined through test scores from exams administered at the end of the programs or through self-assessed improvements in knowledge. Program lengths typically varied from an hour to semester-long programs. Financial behaviors studied included debt management, payday loans, investment knowledge, financing costs, and multi-topic behaviors. Most studies did find an improvement in financial knowledge, usually based on either participant self-reports or test scores. In most cases, behavioral changes were not assessed, and if they were, they were typically changes over the short term.

Each of the 88 studies reviewed in this paper is listed in Table 1. This table categorizes the papers using three themes[2] that emerged from our review: whether the study explicitly deployed a theoretical framework, whether the study had a robust research design (i.e., the study included a control group to robustly test the effects of the financial education intervention), and whether the study examined financial behavior as an outcome, versus focusing exclusively on changes in financial knowledge.

Lack of Explicit Theoretical Framework

Our first theme concerns whether the authors of each study explicitly used theory to structure their analysis. As indicated in the "Theoretical framework" column of Table 1, we found only five papers in our analysis that fit this description. This finding is consistent with prior reviews (e.g., Fernandes et al., 2014) that find that very few studies employed a clear theoretical perspective to help determine theoretical constructs that should be measured and relationships among the constructs. The studies that do explicitly employ theory in their development usually use behavioral theories such as variation theory (Pang, 2010), social learning theory (Fan & Zhang, 2021; Goetz et al., 2011), and family financial socialization theory (Deenanath et al., 2019; Jin & Chen, 2020). We will briefly explain these three theories.

Variation theory posits that learning about a concept or entity requires the learner to understand how it differs from other concepts or entities and that to understand learning we need to understand what features the learner sees as different and chooses to emphasize (Pang, 2010). To experience differences also requires some features of the concept or entity to remain invariant relative to other concepts or entities, and the pattern of what varies and stays constant helps determine learning. For example, in the Pang (2010) study, lessons for one group were designed around having variation in key dimensions

2. In our review, we noted few differences based on age, gender, and ethnicity. We found very few studies in our sample exploring this area. In their meta-analysis, Kaiser and Menkhoff (2017) find that age and gender are not significant factors impacting financial literacy. A couple of papers in our sample note or investigate ethnic differences. De Bassa Scheresberg (2013) note in their research that the Hispanic population is disproportionately disadvantaged by financial illiteracy, while Burt (2020) focuses primarily on solutions to improve financial literacy among the Black population in the United States.

TABLE 1
Papers included in this study related to financial education programs for young adults in Canada and the United States from 2001 to 2021

			Theoretical framework	Robust design	Behavioral outcomes
Summary count data for papers (the percent of the total is in parentheses; 88 papers were reviewed in our analysis)			5 (5.7%)	12 (13.6%)	36 (40.9%)
	Author(s)	Title			
1	Al-Bahrani et al. (2020)	Early causes of financial disquiet and the gender gap in financial literacy: Evidence from college students in the Southeastern United States			
2	Al-Bahrani et al. (2019)	Racial differences in the returns to financial literacy education			
3	Anderson and Card (2015)	Effective practices of financial education for college students: Students' perceptions of credit card use and financial responsibility			×
4	Andrew et al. (2012)	Evidence of student achievement in a high school personal finance course			
5	Barcellos et al. (2016)	Financial education interventions targeting immigrants and children of immigrants: Results from a randomized control trial			×
6	Barreto and Gamble (2020)	Increasing financial literacy among undergraduate students			
7	Bayuk and Altobello (2019)	Can gamification improve financial behavior? The moderating role of app expertise			
8	Bernheim et al. (2001)	Education and saving: The long-term effects of high school financial curriculum mandates			×
9	Bhattacharya and Gill (2020)	Financial education and financial attitudes: Evidence from a high school experiment			
10	Borden et al. (2008)	Changing college students' financial knowledge, attitudes, and behavior through seminar participation			
11	Bosshardt and Walstad (2018)	Does studying economics in college influence loan decisions later in life?			
12	Bowen and Jones (2006)	Empowering young adults to control their financial future			
13	Brown et al. (2014)	State mandated financial education and the credit behavior of young adults			×
14	Burt (2020)	I get money: A therapeutic financial literacy group for Black teenagers			

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TABLE 1 (continued)

	Author(s)	Title	Theoretical framework	Robust design	Behavioral outcomes
15	Carioti (2020)	Student loan debt: A problem-based learning activity for introductory economics students			
16	Carlin and Robinson (2012)	What does financial literacy training teach us?			
17	Chen and Garand (2018)	On the gender gap in financial knowledge: Decomposing the effects of don't know and incorrect responses			
18	Chung and Park (2014)	The effects of financial education and networks on business students' financial literacy			
19	Cole et al. (2016)	High school curriculum and financial outcomes: The impact of mandated personal finance and mathematics courses			×
20	Cole and Shastry (2009)	Smart money: The effect of education, cognitive ability, and financial literacy on financial market participation			×
21	de Bassa Scheresberg (2013)	Financial literacy and financial behavior among young adults: Evidence and implications			×
22	Deenanath et al. (2019)	Purposive and unintentional family financial socialization, subjective financial knowledge, and financial behavior of high school students	×		×
23	Demakis et al. (2019)	Predictors of financial capacity in young adults			
24	Erickson et al. (2019)	A model for youth financial education in extension involving a game-based approach			
25	Fan and Zhang (2021)	The influence of financial education sources on emergency savings: The role of financial literacy	×		×
26	Franklin (2004)	Financial literacy program prepares youth for living on their own			
27	Franklin (2007)	Expanded financial literacy unit helps students make wise choices			×
28	Friedline and West (2016)	Financial education is not enough: Millennials may need financial capability to demonstrate healthier financial behaviors			×
29	Garcia et al. (2017)	The money mentors program: Increasing financial literacy in Utah youths			
30	Gill and Bhattacharya (2015)	Integration of a financial literacy curriculum in a high school economics class: Implications of varying the input mix from an experiment		×	

(The table is continued on the next page.)

TABLE 1 (continued)

	Author(s)	Title	Theoretical framework	Robust design	Behavioral outcomes
31	Gill and Bhattacharya (2019)	The effects of a financial literacy intervention on the financial and economic knowledge of high school students		×	
32	Goetz et al. (2011)	A peer-based financial planning & education service program: An innovative pedagogic approach	×		
33	Grewal and Sweeney (2021)	An innovative approach to educating medical students about personal finance			×
34	Gross et al. (2005)	Strong palliative, but not a panacea: Results of an experiment teaching students about financial literacy			×
35	Harter and Harter (2010)	Is financial literacy improved by participating in a stock market game?		×	
36	Haynes and Chinadle (2007)	Project improves financial, economic literacy of America's youth			
37	Haynes-Bordas et al. (2008)	Effectiveness of financial education on financial management behavior and account usage: Evidence from a "second chance" program			×
38	Hibbert et al. (2013)	Does knowledge of finance mitigate the gender difference in financial risk-aversion?			
39	Hubbard et al. (2016)	Using online compound interest tools to improve financial literacy		×	
40	Hunter and Gillen (2015)	The short-term effectiveness of a college-based financial reality simulation in building financial awareness			
41	Jin and Chen (2020)	Comparing financial socialization and formal financial education: Building financial capability	×		
42	Jobst (2014)	Does a university financial literacy course change financial behavior?			×
43	C. L. Johnson and Schumacher (2016)	Does webinar-based financial education affect knowledge and behavior?			×
44	J. Kim et al. (2005)	Credit counseling, debt management effective			×
45	K. T. Kim et al. (2019)	Financial knowledge and short-term and long-term financial behaviors of millennials in the United States			×
46	K. T. Kim and Lee (2018)	Financial literacy and use of payday loans in the United States			×

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TABLE 1 (continued)

	Author(s)	Title	Theoretical framework	Robust design	Behavioral outcomes
47	K. T. Kim and Xiao (2021)	Racial/ethnic differences in consumer financial capability: The role of financial education			
48	Kuntze et al. (2019)	Improving financial literacy in college of business students: Modernizing delivery tools		×	
49	Lindsey-Taliefero et al. (2011)	A review of Howard University's financial literacy curriculum			
50	Liu et al. (2011)	A learning game for youth financial literacy education in the Teen Grid of Second Life three-dimensional virtual environment			
51	Loke et al. (2015)	Increasing youth financial capability: An evaluation of the MyPath savings initiative			
52	Lührmann et al. (2018)	The impact of financial education on adolescents' intertemporal choices			
53	Lusardi et al. (2020)	Assessing the impact of financial education programs: A quantitative model		×	×
54	Lusardi et al. (2017)	Visual tools and narratives: New ways to improve financial literacy		×	
55	Mandell and Hanson (2009)	The impact of financial education in high school and college on financial literacy and subsequent financial decision making			×
56	Mandell and Klein (2009)	The impact of financial literacy education on subsequent financial behavior			
57	Matheson et al. (2020)	An assessment of personal financial literacy teaching and learning in Ontario high schools			
58	McCarthy (2015)	Today's college student: Measuring the effectiveness of financial literacy education and effect on subsequent student debt			×
59	McKenzie (2009)	The financial literacy of university students: A comparison of graduating seniors' financial literacy and debt level			×
60	Meadows and Mejri (2021)	Student perceptions of the implications of a financial literacy project within a college mathematics course			
61	Modestino et al. (2019)	Assessing the effectiveness of financial coaching: Evidence from the Boston youth credit building initiative		×	×

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TABLE 1 (continued)

	Author(s)	Title	Theoretical framework	Robust design	Behavioral outcomes
62	Mountain et al. (2021)	Does type of financial learning matter for young adults' objective financial knowledge and financial behaviors? A longitudinal and mediation analysis			×
63	Nielsen (2011)	A retrospective pretest-posttest evaluation of a one-time personal finance training			
64	O'Neill et al. (2000)	Money 2000^{TM}: Does it change financial behavior?			
65	Osteen et al. (2007)	Financial management education: Its role in changing behavior			
66	Palmer et al. (2010)	Improving financial awareness among college students: Assessment of a financial management project			
67	Pang (2010)	Boosting financial literacy: Benefits from learning study	×	×	
68	Peng et al. (2007)	The impact of personal finance education delivered in high school and college courses			
69	Penner and Spizman (2019)	An investigation of personal financial literacy education			
70	Popovich et al. (2020)	Community college students' response to a financial literacy intervention: An exploratory study			×
71	Reich and Berman (2015)	Do financial literacy classes help? An experimental assessment in a low-income population		×	×
72	Robinson et al. (2016)	Evaluation strategies in financial education: Evaluation with imperfect instruments			×
73	Rosacker and Rosacker (2016)	An exploratory study of financial literacy training for accounting and business majors			
74	Rothwell and Wu (2019)	Exploring the relationship between financial education and financial knowledge and efficacy: Evidence from the Canadian Financial Capability Survey			
75	Sardone (2008)	Teaching financial concepts to undergraduates using a simulation and spreadsheet tool			
76	Seyedian and Yi (2011)	Improving financial literacy of college students: A cross-sectional analysis			
77	Skimmyhorn (2016)	Assessing financial education: Evidence from boot camp			×
78	Skimmyhorn et al. (2016)	Assessing financial education methods: Principles vs. rules-of-thumb approaches		×	
79	Smith et al. (2011)	Evaluation of financial fitness for life program and future outlook in the Mississippi Delta		×	

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TABLE 1 (continued)

	Author(s)	Title	Theoretical framework	Robust design	Behavioral outcomes
80	Stoddard and Urban (2020)	The effects of state-mandated financial education on college financing behaviors			×
81	Tennyson and Nguyen (2001)	State curriculum mandates and student knowledge of personal finance			
82	Urban et al. (2020)	The effects of high school personal financial education policies on financial behavior			×
83	Wagner and Walstad (2019)	The effects of financial education on short-term and long-term financial behaviors			×
84	Walstad et al. (2010)	The effects of financial education on the financial knowledge of high school students			
85	Wann (2016)	The impact of teaching financial literacy to college students			×
86	Wolla (2017)	Evaluating the effectiveness of an online module for increasing financial literacy			
87	Xiao et al. (2014)	Earlier financial literacy and later financial behaviour of college students			×
88	Yates and Ward (2011)	Financial literacy: Examining the knowledge transfer of personal finance from high school to college to adulthood			

Notes: Academic articles included in our review were selected primarily using the databases ABI-INFORM Global, Education Source Complete, and EconLit. We restricted our search to the period from 2000 to 2021 and used the terms "youth" and "financial education" along with many of their synonyms as our search terms. To ensure completeness, we did a secondary search of Web of Science and Google Scholar for articles with the subject of financial literacy, manually reviewing the title and subject for all articles in this secondary search to ascertain appropriateness to our selection of studies. Using this approach, we identified 607 unique academic articles from these combined sources. These 607 papers were then individually reviewed to ensure they were within our scope (i.e., studies related to financial education programs in Canada and the United States from 2001 to 2021). After removing studies outside of our scope (e.g., were related to education programs outside of Canada and United States, and those which only mentioned, but did not focus on, financial education programs), our literature review consists of the 88 studies listed above. The three right-hand columns indicate which of the identified studies (1) explicitly utilized a theoretical framework in their analysis, (2) had a robust research design (i.e., whether the study included a control group to robustly test the financial education intervention), and (3) examined financial behavior as an outcome as compared to focusing only on changes in financial knowledge.

relevant to financial situations (such as risk or interest rates) while keeping other less critical features constant across examples and scenarios. Critical features were also only varied one at a time while holding other characteristics constant. Students taught using lesson plans based on variation theory outperformed students in the control group, and follow-up assessments done 6 months later showed this outperformance persisted and increased over time.

Social learning describes how changes in behavior can arise from directly observing others' behaviors. Social learning theory posits that people learn from one another through observation, imitation, and modeling (Bandura, 1971). This suggests that individuals learn over many years through social interaction and thus slowly acquire the knowledge that forms their values and attitudes. The theory is applicable to financial behavior in the sense that financial consumers would acquire financial knowledge through social interactions, including formal educational opportunities, over time. With these interactions, they form attitudes and knowledge about finances that inform and impact their financial behaviors. Fan and Zhang (2021) use social learning theory to test whether an individual's prior experience with a financial education program brings about a specific behavioral change (i.e., having an emergency savings fund). They use self-reported data from over 17,000 individuals to show that while those with higher levels of financial literacy were more likely to have emergency savings, the effects of financial education did not significantly affect financial literacy except when individuals had received financial education through both their schooling and occupation. They recommend improving current training and emphasize the need for continuous financial education to continually reinforce positive behavior and have more long-term effect on individuals' financial behavior.

Family financial socialization theory proposes that financial behavior and motivation are formed within familial interactions (Gudmunson & Danes, 2011). This theory posits that the creation of desirable financial behavior and motivation for future financial behavior change comes from family interactions, relationships, and social environment both in childhood and later (Aprea et al., 2016). Danes and Yang (2014) state that family is the primary socialization unit for young adults to learn about finances and that the family also serves as a filter for financial information encountered in broader social contexts. The theory suggests values, beliefs, attitudes, and experiences that are held by or learned in the family are important factors that determine longer-term financial behavior.

Two of the three theories identified in our review focus primarily on learning, which seems reasonable if the emphasis is on acquisition of financial knowledge. However, the previous literature reviews and societal needs suggest the more important issue is long-term improvements in financial behavior. To achieve such changes, other factors likely need to be taken into account. Fernandes et al. (2014) find that factors such as confidence, propensity to plan, risk-taking, and numeracy also can affect financial behavior, while Lusardi and Mitchell (2014) suggest possible roles for cognitive ability, family background, and education.

The goals of financial literacy education, with an emphasis on actual long-term behavioral change, thus suggest that other theories more focused on behavioral change

could be deployed. For example, the theory of planned behavior can provide a framework for incorporating broader influences such as the social environment, values, and attitudes as well as an individual's intent to better understand the determinants of positive financial behavior in young adults (Ajzen, 1991; Croy et al., 2010). This broader perspective may be especially relevant for young adults, who presumably have more interactions with those outside their families. The theory of planned behavior is often considered to be a dominant theory in predicting behavior in the social sciences, particularly given that meta-analyses provide support for its efficacy (e.g., Armitage & Conner, 2001; Bagozzi & Kimmel, 1995; Conner & Armitage, 1998). Surprisingly, despite what seems like obvious applicability to financial education and its impact on financial behaviors, none of the studies in our sample employed this theory, although it has been used for studies of financial literacy in other demographics (e.g., Croy et al., 2010).

The other papers in our sample do not identify an underlying theoretical framework for their research design. We regard this as a serious shortcoming, as an explicit theoretical perspective is important to provide guidance for key factors to proxy, measure, and control. It also helps others build upon the theory if studies are structured around theory testing. While we acknowledge that theories by themselves do not specify how a particular theoretical construct is to be proxied or measured, they do provide guidance on *what* needs to consider as potentially affecting the outcome of interest. For example, an implicit theory that individuals lack the financial knowledge to make good decisions will result in studies that emphasize knowledge acquisition within educational programs to improve literacy.

Theories, such as the theory of planned behavior, provide a framework emphasizing the importance of considering factors like attitudes, perceived behavioral control, normative beliefs, and the perspectives of significant individuals when determining an individual's intent. According to this theory, behavior arises from both intent and ability. While this perspective does not specify exact proxies or measurements for these factors in the context of financial behavior, it does encourage researchers to incorporate these elements in some manner within their research design. Without the conceptual lens provided by theory, studies may either fail to detect effects or identify effects that do not actually exist simply because they have not included or controlled for the appropriate theoretical constructs. Despite the benefits of having a theoretical foundation, it is important to acknowledge that measurement issues may still pose challenges to external validity, as well as application of incorrect or significantly incomplete models.

The absence of a theoretical perspective may impact financial education programs for the same reasons mentioned earlier. For an educational program to effectively influence behavior, it must not only impart the relevant knowledge but also ensure that other factors influencing the application of that knowledge in decision-making are considered. The identification of these factors is contingent on the theoretical framework employed. While we acknowledge that researchers in this field are likely to be utilizing an implicit theory of behavior to determine which factors to measure, manipulate, or control, articulating theories explicitly enhances others' understanding of the paradigm being used. This, in turn, encourages researchers to contemplate more thoroughly the factors

influencing financial outcomes, as well as contributing to the testing and development of existing theories.

Robust Research Design: Experimental Design

Robust research designs are desirable to minimize bias and improve reliability of research findings (Campbell & Stanley, 1963; Shadish et al., 2002; Slavin, 2002). In our review, we categorize research designs into one of three categories: experimental design, quasi-experimental design, and nonexperimental design. While any research design can have flaws, studies using nonexperimental or quasi-experimental designs are particularly susceptible to confounds that affect result reliability. In Table 1, in the "Robust design" column, we identified only 12 of the 88 studies as including a control group in their research design, thus qualifying as having a robust experimental design in our review.

Most of the other studies employed quasi-experimental designs, which is usually viewed as the next best design when an experimental design cannot be used. Bowen and Jones (2006) and Palmer et al. (2010) are two examples of studies using a quasi-experimental design. Both use pre/post-test designs without a control group (to test for any changes from the baseline condition) or randomization of participants (to reduce the impacts of biased sampling).

Many of the studies examining the effects of financial education programs use non-experimental research designs (e.g., Bernheim et al., 2001; Borden et al., 2008; Mandell & Klein, 2009; Peng et al., 2007; Tennyson & Nguyen, 2001). In these studies, the authors themselves often administered the programs and then tested the participants only post-implementation to determine financial literacy. It is difficult to attribute any findings of improved financial knowledge to the education program in question using this type of design as other factors (e.g., maturation, social effects, or demand effects) are nearly impossible to convincingly rule out as causal factors. One issue, for example, is that measuring financial knowledge at a specific point in time rather than measuring its change over time makes it difficult to distinguish the effect of even very recent financial education from the effects of other influences, such as those arising from the family environment.

Determining which financial educational approaches improve subsequent financial behaviors is critical to improving literacy. More generally, problems with research design may contribute to the finding by Fernandes et al. (2014) that financial education programs and other interventions to improve financial literacy explained only 0.1% of the variance in individuals' financial behaviors. Interestingly, Kaiser and Menkhoff (2017), in their meta-analysis, attribute their more positive findings relative to those of Fernandes et al. (2014) to the inclusion of more recent studies using stronger research designs.

Details on Nature of Educational Program

Much of the literature included in this review examines school curriculum-based programs. We thus briefly examine some key principles of instructional design that should improve the acquisition of knowledge by those participating in educational programs.

The exact principles of educational design vary depending on the educational theoretical perspective being used. In general, however, Bruner (1996) suggests that effective instructional design should facilitate students' readiness to learn by providing necessary context, being as simple as possible, and by facilitating continuity or retention of the learning. Learners also typically need to be actively engaged in the learning process. Therefore, an active dialogue between the instructors and the learners is necessary such that the instructional format is appropriate for the learners' current state of understanding.

An example of an instructional design model is the ADDIE (analyze, design, develop, implement, and evaluate) model, which highlights this active process for learning (Forest, 2014). This model focuses on first analyzing what needs to be learned before developing the program and ends with an evaluation of the program to ensure its objectives have been achieved. The model emphasizes learning as an active process in which the learners must be engaged with the instructional materials.

Another example is the first principles of instruction model (Merrill, 2002), which suggests that activation of new learning is based on a foundational learning experience. In other words, to learn most effectively, students should have prior experience or knowledge about a topic and will learn more when they are directed to recall this prior knowledge. Thus, acquisition of knowledge does not necessarily predict a change of behavior unless prior knowledge enables the learner to both assimilate new knowledge and form an intent to change behavior.

If instructional design principles are important to create programs that improve learning, then studies of financial education programs should, as part of their research design, be clearer about how programs have implemented these principles. However, our review of the studies of financial education programs suggests there is often not sufficient information provided about the programs to assess whether it is reasonable to expect the programs to have an effect. In keeping with the previous discussion of research design, what is needed is a clearer understanding of what is being tested (i.e., the experimental manipulation), and how it relates to instructional design principles. Consideration of instructional design was also noted in Fernandes et al. (2014) and Lusardi and Mitchell (2014). Amagir et al. (2018) note an analogous concern, specifically calling for experiential learning such as hands-on activities, interactive methods, and simulations to be incorporated into financial education programs for them to be effective.

Measures of Outcomes

As stated previously, we define financial literacy as both the possession of financial knowledge and the ability to exhibit sound financial behavior. Improving financial literacy ought to be the intended effect of financial education programs. Thus, when considering outcomes of financial education programs, it is important to measure impacts on both financial knowledge and financial behaviors. We find, however, that most of the studies in our sample (52 of 88) exclusively use measures of financial knowledge. These include scores from testing participants on their financial knowledge, self-assessments of increases in financial knowledge, or a combination of test scores and self-assessments.

For example, Borden et al. (2008) use test scores to determine the effect of a financial education program on college students. Less than half of the papers reviewed (36 of the 88 studies in our sample) attempt to measure some behavioral changes following a financial education program (see the "Behavioral outcomes" column in Table 1 for specific studies identified). Some examples of behavioral measures include asset accumulation in early adulthood (Bernheim et al., 2001), credit delinquency (Brown et al., 2014), participation in equity markets (Deenanath et al., 2019), increased credit scores (Urban et al., 2020), and increased contributions to a retirement plan (Skimmyhorn, 2016).

While improved financial behaviors are a desired outcome of financial literacy programs, it is sometimes difficult to reliably obtain measures for these improvements. Even in the studies that have collected behavioral outcomes, most of these variables reflect self-reported measures. In addition, the measures of outcomes tend to be quite short-term, presumably because the outcome data collection instruments are most easily administered right after the education programs (e.g., Borden et al., 2008; Walstad et al., 2010; Xiao et al., 2014). Even when studies do examine actual financial behaviors on a subsequent date, considering other factors beyond the educational program that would impact such behaviors is difficult (e.g., Brown et al., 2014; Harter & Harter, 2009; Peng et al., 2007; Tennyson & Nguyen, 2001). This challenge ties back to our previous discussion of theoretical frameworks, which would be helpful in identifying what these other factors might be and thus what factors should be controlled for in evaluating changes in financial behaviors.

In summary, the review of prior academic articles shows that most prior research focuses on changes on financial knowledge with little or no consideration for the effects of financial education on future behavior. Even when they do measure behavioral changes, these measurements often rely on self-reports, which may not correspond well to actual changes. The time between the financial education and assessment of outcomes is often too short to understand the true enduring impact of the programs.

OPPORTUNITIES FOR ACCOUNTING RESEARCHERS

The majority of research on means of improving financial literacy, financial education, and financial outcomes for individuals is being published in education, finance, and economics journals. This trend suggests that most researchers in this area are in those disciplines. Surprisingly, accounting researchers seem to be making limited contributions to this area, despite interest by the professional accounting bodies such as CPA Canada and AICPA. However, there are a few examples of accounting research related to financial literacy. A paper by Krische (2019) investigates how investment experience and financial literacy affect investing judgments of investors and noninvestors. She finds a clear effect of accounting disclosures and financial literacy on investors' judgments, though not on noninvestor judgments.

Other studies of financial literacy in accounting have been carried out in corporate contexts (e.g., investigations of the financial literacy of audit committees or boards, such as Emmerich et al., 2005); or in accounting educational contexts, such as Rakow (2019),

who examines how to incorporate financial education into accounting courses; and Guthrie and Nicholls (2015), who provide guidance to help students engage in financial goal-setting and budget preparation to reach those goals.

We feel this is an exciting opportunity for accounting researchers, given the government and societal interest in this area; the expertise of accounting researchers in areas such as budgeting, tax, and factors affecting decision-making; and the interest of many business schools in societal impact and sustainability.[3]

A few selected areas we feel accounting researchers could contribute to include the following:

- *Budgeting*: Totenhagen et al. (2015) identify budgeting as a key part of financial education. There are many years of budgeting research findings in accounting, including behavioral effects of budgeting, and commitment to budgets, largely in the organizational context (e.g., Wentzel, 2002). Accounting researchers could potentially draw on their knowledge of both this literature and experience in teaching to improve the practice of budgeting by individuals, and the factors likely to affect both the creation of a budget and adherence to budgets.
- *Information presentation and disclosures*: Accounting researchers have examined various aspects of disclosure on investors, including readability (e.g., D. T. Johnson et al., 2002), format (e.g., Elliott et al., 2017), and presentation of multiple benchmarks (e.g., Han & Tan, 2007). Further work to examine how to organize disclosures for nonprofessional investors could aid in developing the kind of choice architecture Fernandes et al. (2014) call for to aid investor decision-making and reduce the effects of bias. A step in this direction is provided by Kelly et al. (2012), who examine investor reliance on analyst recommendations and look at mechanisms such as warnings and requiring investors to do their own assessment to reduce over-reliance. However, as Lynch and Wood (2006) note, disclosure may not be helpful if there are weak associations between intention and behavior, or decisions are based on emotion or habit.
- *Financial outcomes*: As noted above, accounting researchers have examined the effects of information on investor decisions. However, studies of other types of outcomes are possible, such as the effects of financial literacy on small business owners. For example, Dickins et al. (2016) find that owners of family businesses have limited financial knowledge in several areas that should be relevant to business performance, although they are fairly satisfied with their own business performance. It is not clear from this study whether the limitations in financial knowledge are affecting firm performance, though this possibility exists.
- *Taxes*: Totenhagen et al. (2015) note that 92% of educators and parents felt that income taxes were an important topic to cover in financial education. However, few financial education programs noted coverage of taxes, and de Clercq and

3. This interest is likely in part because business schools are more involved with organizations such as the Association to Advance Collegiate Schools of Business, the European Foundation for Management Development, and Principles for Responsible Management Education.

Aprea (2023) also note a paucity of studies related to tax literacy. De Clercq and Aprea begin to develop this concept, including tax literacy of an individual. One Canadian study by Genest-Gregoire et al. (2017) was noted, which focuses on measuring the tax literacy of Quebec residents. Tax researchers could potentially contribute to this area through research of factors that contribute to tax literacy, as well as factors influencing individuals' intent and behavior in paying taxes. Some research already exists in this area, such as Alexander et al. (2018) and Brackin (2014).

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FROM THE REVIEW

Governments and other bodies (including CPA Canada) are concerned about financial literacy in young adults, a group often vulnerable to financial challenges and that possesses less financial experience relative to the adult population (Altintas, 2011). Young adults are just beginning to have increased financial responsibilities and thus may be more interested in financial education. Their new and growing financial responsibilities may make them particularly susceptible to negative consequences when they are not sufficiently financially literate. While attempts have been made to document the effects of education programs on this group, the results of these studies have been mixed. Findings show that while some of the approaches to financial literacy have been effective (e.g., Bernheim et al., 2001), many approaches seem to have had no significant impacts on financial literacy. This lack of consistent findings mirrors the results of other literature reviews done across all age groups, as discussed earlier in this paper.

In this study, we review recent studies of the effectiveness of financial education programs in improving financial knowledge and behaviors among young adults in Canada and the United States. We analyze the theories employed by the prior studies, the research design, and the nature of the financial outcome measures. We have identified several limitations based on our analysis of these studies.

First, out of the 88 studies that examine the effectiveness of financial education programs, only 5 studies employ theories of behavior to develop their study research or educational program. We suggest that a theoretical perspective is important to both the research and educational program designs, as it identifies the specific factors that are considered important for the program to be effective, and therefore those the research design must measure or control. Our analysis of the literature supports prior findings that few studies on financial literacy have employed a theoretical perspective (e.g., Fernandes et al., 2014).

Importantly, we show that the issue of weak research design affects almost all the financial literacy studies in our sample. Without better experimental designs, researchers will have difficulty clearly ruling out a variety of confounds that could affect the reliability of their results.

Despite the importance of instructional design, few studies provide much information about the design of the programs being studied. We recommend that studies of financial education programs be clearer about the instructional design principles used in the

program to help in understanding when and how programs should be expected to influence specific outcomes (e.g., changes in future financial behaviors or increases in financial knowledge).

Lastly, our review shows that the focus of most of these studies is primarily on the individual acquisition of financial knowledge, with less emphasis on long-term behavioral change. This change in behavior is an important part of increasing financial literacy. Those studies that do consider behavioral change often focus on self-assessments for reporting these. In addition, they often fail to consider other factors (e.g., experience) that affect the formation and change of behaviors.

As further studies are carried out in this important area, we feel that it is critical that future researchers pay careful attention to the instructional design of the educational programs, measurement, research design, and use of behavioral theories. Improved design and assessment of financial education programs will lead to programs that more effectively increase financial literacy—something that has significant implications for societal well-being.

We acknowledge that many obstacles exist to improving financial education programs and their assessment. For example, measuring long-term behavioral changes due to financial education programs is difficult as one is required to follow specific individuals for potentially significant time periods and outside of the classroom environment. There are also potential ethical constraints to implementing a fully randomized controlled trial by limiting access to financial education. However, given the importance of these findings for public policy and the potentially huge societal impact, significant funds are likely attainable for a broad longitudinal analysis over multiple years. Testing the effectiveness of financial education across jurisdictions with and without mandated financial literacy programs, or implementing the program in specific locations within a jurisdiction without mandates, would result in more robust research design without removing access to important financial education. Focusing more efforts on financial education of young adults 18 years and older can also help alleviate requirements for parental consent and target the population that arguably has a more urgent need for financial literacy.

Given the interest of professional accounting bodies and governments in financial literacy, we see this as a promising area for accounting researchers to examine. Accounting researchers have long experience in many of the key topics in financial education, such as budgets, debt, investing, and taxes, and in use of strong research designs and outcome constructs. Financial literacy research represents an excellent opportunity for accounting academics to have clear societal impact and to contribute to the well-being of young adults, whom most academics have regular contact with as students. Future research in this area from accounting researchers could open interesting new lines of inquiry and contribute to important policy discussions.

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