



## EARLY-LIFE SCHOOLING AND COGNITION AND LATE-LIFE FINANCIAL LITERACY IN THE WISCONSIN LONGITUDINAL STUDY

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Because defined contribution pension plans and individual retirement accounts have become much more common, the responsibility for saving, investing, and managing retirement income now falls largely on individuals. Scholars have paid little attention to the potential for cognitive problems, which are increasingly common in late life, to influence the ability of individuals to effectively manage an increasingly complicated financial world. Using the Wisconsin Longitudinal Study, we examine the relationship between early- and late-life cognitive ability and late-life financial literacy. Results indicate that, for individuals without college degrees, late-life cognitive functioning is positively associated with financial literacy in the retirement years, although this relationship is weaker once early-life cognition is included in the analysis. Because the role of cognitive functioning in determining financial outcomes is likely to become increasingly important as the complexity of individuals' financial lives grows, policymakers should consider developing strategies to help simplify the financial lives of older Americans.

The shift toward defined contribution pension plans and individual retirement accounts means that the responsibility for saving, investing, and managing retirement income now falls largely on individuals. There is a large and growing literature exploring individuals' capacity to effectively manage their finances in this context. However, scholars have devoted little attention to the potential for cognitive problems, which are increasingly common in late life, to influence the capacity of individuals to effectively manage a progressively more complicated financial world. This paper focuses on the relationship between cognitive functioning in early and late life and older adults' ability to effectively manage their finances.

### *The Importance of Financial Literacy for Retirement*

Most current employment-related pensions are in the form of defined contributions, which are managed by the employee. However, there is considerable

evidence that many Americans lack the skills to effectively complete this task. Further, financial literacy skills are not only important for retirement planning, they are just as important during retirement.

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Older individuals have a complex array of defined contribution plans, private individual retirement accounts, and general stock market investments that must be managed throughout retirement. Financial calculations depend on individuals' abilities to estimate their life expectancy and the performance of their investments—tasks that

place high cognitive demands on retirees. This situation is potentially problematic because cognitive abilities decline at older ages. Existing studies, which focus primarily on how cognition affects wealth accumulation, likely underestimate the impact of cognitive functioning on broader financial outcomes. Further, most studies have not controlled for childhood cognitive ability. Nonetheless, the extant literature generally demonstrates a link between cognition and wealth accumulation (Agarwal et al. 2007; Christelis, Jappelli, and Padula 2006; Cole and Shastry 2010; Korniotis and Kumar 2007; Zagorsky 2007).

### *Data and Methods*

We use data from the Wisconsin Longitudinal Study, a sample of Wisconsin high school graduates from the class of 1957, to test whether early- and late-life cognitive abilities are related to financial skills in late life. We utilize a measure of financial literacy that supplements existing measures and has the virtue of being drawn from questions that are asked on many surveys. Our survey items assess how knowledgeable individuals are regarding their own assets, their retirement savings, and their immediate financial resources. We defined two measures based on 2003/2005 survey data: 1) the percent of asset categories (including property, retirement plans, and life insurance cash values) for which the respondent provided a dollar amount (asset knowledge), and 2) knowledge of the value of retirement accounts (pension knowledge)—a binomial variable constructed from the answer to the question, “If you added up all of your and your spouse’s checking accounts, savings accounts, or money market funds, about how much would they amount to right now?” The first measure is intended to capture the respondent’s overall awareness of his or her current financial situation, while the second

is intended to capture day-to-day financial awareness.

Early-life cognitive ability was measured by the Herman-Nelson Test of Mental Ability. We used three measures to assess late-life cognitive ability: 1) a test of working memory, in which respondents were read a series of digits and were then asked to repeat the digits in ascending numerical order, 2) a test of delayed verbal memory, in which participants were asked to recall as many words as possible from a list they had heard 10 minutes earlier, and 3) a test of verbal fluency, in which respondents had 60 seconds to name as many types of either foods or animals as they could. Models controlled for parental socioeconomic status (in childhood), basic demographic characteristics, high school rank and coursework variables, and years of schooling. We ran separate models for those with at least a college degree and those without a college degree.

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### *Results*

Results revealed that: 1) cognitive ability is linked to financial knowledge for those without college degrees but not for those with college degrees, and 2) for those without college degrees, late-life measures of cognitive functioning are correlated with financial knowledge, but these effects weaken substantially after accounting for childhood cognitive functioning. For those without a college degree, working memory was positively correlated with both asset knowledge and pension knowledge; these relationships were reduced 50-90 percent

and 25 percent, respectively, after accounting for early-life cognitive functioning. Similarly, for non-graduates, delayed recall was positively correlated with both asset knowledge and pension knowledge; the relationships were reduced by 30 percent and 15 percent, respectively, after controlling for early-life cognitive functioning. The third measure of adult cognitive ability, verbal fluency, was also positively correlated with both asset knowledge and pension knowledge for those without college degrees; the associations were reduced by 25-30 percent and 20 percent, respectively, and the standard errors increased substantially, once early-life cognitive functioning was included in the model.

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*The effects of cognitive ability are striking given the relatively high educational attainment of this sample. Even amongst the most educated, there are large differences in financial literacy based on cognitive ability.*

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#### *Implications and Conclusions*

Cognitive functioning difficulties in late life are problematic for financial knowledge. Further, early-life cognitive functioning plays a role above and beyond current cognitive functioning; therefore, failing to control for childhood cognition leads to an overestimation of the effects of contemporaneous cognitive functioning. The extent to which differences in cognition reflect environmental differences, such as school quality, rather than genetic differences, is not clear. The effects of cognitive ability are striking given the relatively high educational attainment of this sample. Even amongst the most educated, there are large differences in financial literacy based on cognitive ability. The

current analyses cannot indicate how individuals without high school degrees fare, although the link between lower cognitive scores and financial literacy provides some indication of what that relationship may be.

A few caveats to this study should be addressed. First, because the analyses excluded respondents who refused to answer, we conducted supplementary analyses to explore the possible effects of this restriction. Results suggest that excluding refusals, especially among women, may mean that our estimates are conservative. In addition, about 20 percent of the overall sample did not have a pension account. Because those without pension accounts are more likely to be women, have low incomes, and have low educational attainment, their exclusion may have affected the model results. Finally, while the results reveal associations between cognitive ability and late-life financial literacy, we cannot claim these are entirely causal relationships.

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The results of this study demonstrate the problems that older adults face today, and that younger cohorts will face to an even greater extent in future years. As the complexity of individuals' financial lives grows, the role of cognitive functioning in determining financial outcomes is likely to become increasingly important. The tasks in which older individuals must engage to manage their financial lives are complex in

ways that pose real challenges for those with more limited cognitive functioning. To ameliorate this effect, policymakers must

develop strategies to help simplify the financial lives of older Americans.

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## ***The Financial Literacy Research Consortium***

The Financial Literacy Research Consortium (FLRC) consists of three multidisciplinary research centers nationally supported by the Social Security Administration. The goal of this research is to develop innovative programs to help Americans plan for a secure retirement. The Center for Financial Security is one of three FLRC centers and focused on saving and credit management strategies at all stages of the life cycle, especially helping low and moderate income populations successfully plan and save for retirement and other life events, including the use of Social Security's programs.

## **The Center for Financial Security**

The Center for Financial Security at the University of Wisconsin-Madison conducts applied research, develops programs and evaluates strategies that help policymakers and practitioners to engage vulnerable populations in efforts which build financial capacity. The CFS engages researchers and graduate students through inter-disciplinary partnerships with the goal of identifying the role of products, policies, advice and information on overcoming personal financial challenges.

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