

Insights: Financial Capability

September 2020

Authors:

Lei Yu, Ph.D.

Rush Alzheimer's Disease Center

Patricia Boyle, Ph.D.

Rush Alzheimer's Disease Center

Gary Mottola, Ph.D.

FINRA Investor Education
Foundation

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This issue brief summarizes the findings from a paper titled "Confidence in Financial and Health Literacy and Cognitive Health in Older Persons." The full paper will be published in a forthcoming issue of the Journal of Alzheimer's Disease. The corresponding author for this issue brief and the full paper is Lei Yu (lei_yu@rush.edu).

Confidence in Financial Literacy and Cognitive Health in Older Persons

Summary

Using data from nearly 1,000 community-dwelling older persons participating in the Rush Memory and Aging Project, this research finds that confidence in financial literacy is associated with a decreased risk of Alzheimer's dementia and slower decline in cognition, above and beyond objectively measured financial literacy. Further, older adults who express underconfidence relative to their actual level of financial literacy have greater risk of developing Alzheimer's dementia and experience faster cognitive decline. While it is not completely clear why this relationship exists, it could be that confident people are motivated to engage with the world and actively seek to acquire new information. Further, in the face of distraction and setbacks, confident people are more persistent and tend to exhibit greater effort toward meeting their goals.

Background

Financial literacy is crucial for independence and well-being in old age. Lower financial literacy is not only associated with poorer decision making¹, but it is also implicated in poorer cognitive health and an increased risk of dementia^{2,3}. Prior research has focused primarily on objectively measured literacy (*i.e.*, what people actually know). However, the extent to which confidence in literacy (*i.e.*, what people believe they know or perceived literacy) is implicated in cognitive outcomes has not been studied.

According to financial studies, confidence in literacy is as important as objective literacy with regard to financial behaviors. Both are associated with a range of financial decisions including credit card payments, borrowing behaviors, investment choices, and decisions to seek financial advice⁴. Adults with high confidence in their financial literacy and high objective literacy are substantially more likely to engage in activities promoting greater financial well-being. Some work even suggests that confidence in financial literacy is a stronger predictor of financial outcomes⁵. Built upon these findings, this research hypothesized that confidence in financial literacy influences cognitive health in older persons, even above and beyond objectively measured financial literacy.

Study Participants

To test this hypothesis, this research leveraged data from 974 community-dwelling older persons participating in the Rush Memory and Aging Project (MAP). MAP is a community-based cohort study of aging and dementia⁶. The study recruits older persons from retirement communities, subsidized housing facilities, and local churches as well as other social service agencies in the Chicago metropolitan area. Participants included in this research on average were 81.2 years old (Standard Deviation [SD]: 7.5; Range: 59.0 – 100.2) with 15 years of education (SD: 3.0; Range: 5 – 29). About three quarters were female.

Financial Literacy and Confidence in Financial Literacy

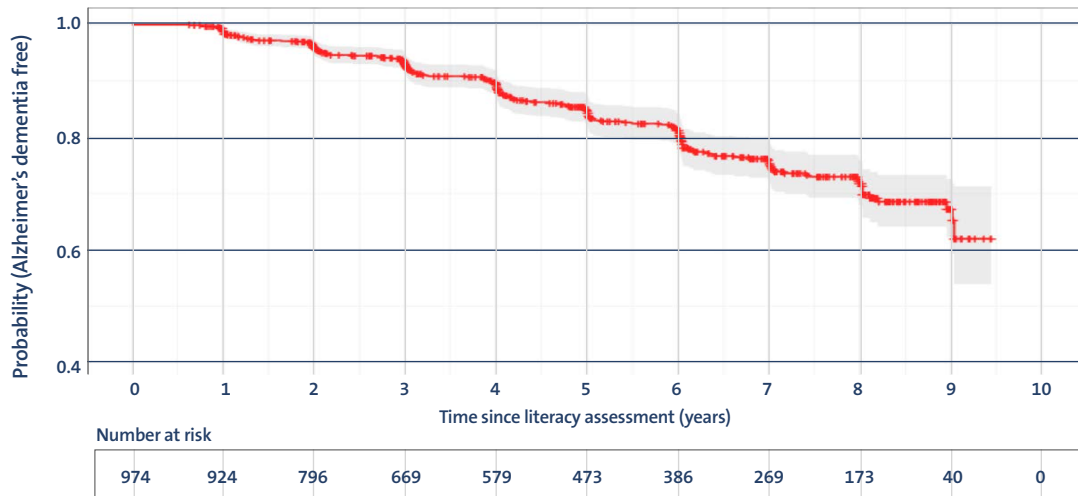
Participants completed a financial literacy assessment as well as questions regarding their confidence in financial literacy. Financial literacy was assessed using a 23-item instrument adapted from the Health and Retirement Study⁷. The instrument included 12 items that assess knowledge of financial concepts (*e.g.*, mutual funds, compound interest, investment types, and financial institutions), eight items that assess numeracy and three items that assess both financial knowledge and numeracy. Each answer was scored as correct or wrong, and scores for each question are tallied. The total score was quantified as the percentage of questions answered correctly, ranging from 0 (*i.e.*, none of the items was correctly answered) to 100 (*i.e.*, all items were correctly answered).

Participants were asked to rate level of confidence in their response to each financial knowledge question using a 4-point scale with 1 indicating not at all confident and 4 indicating extremely confident⁸. Confidence in financial literacy was measured by averaging confidence ratings across the individual questions.

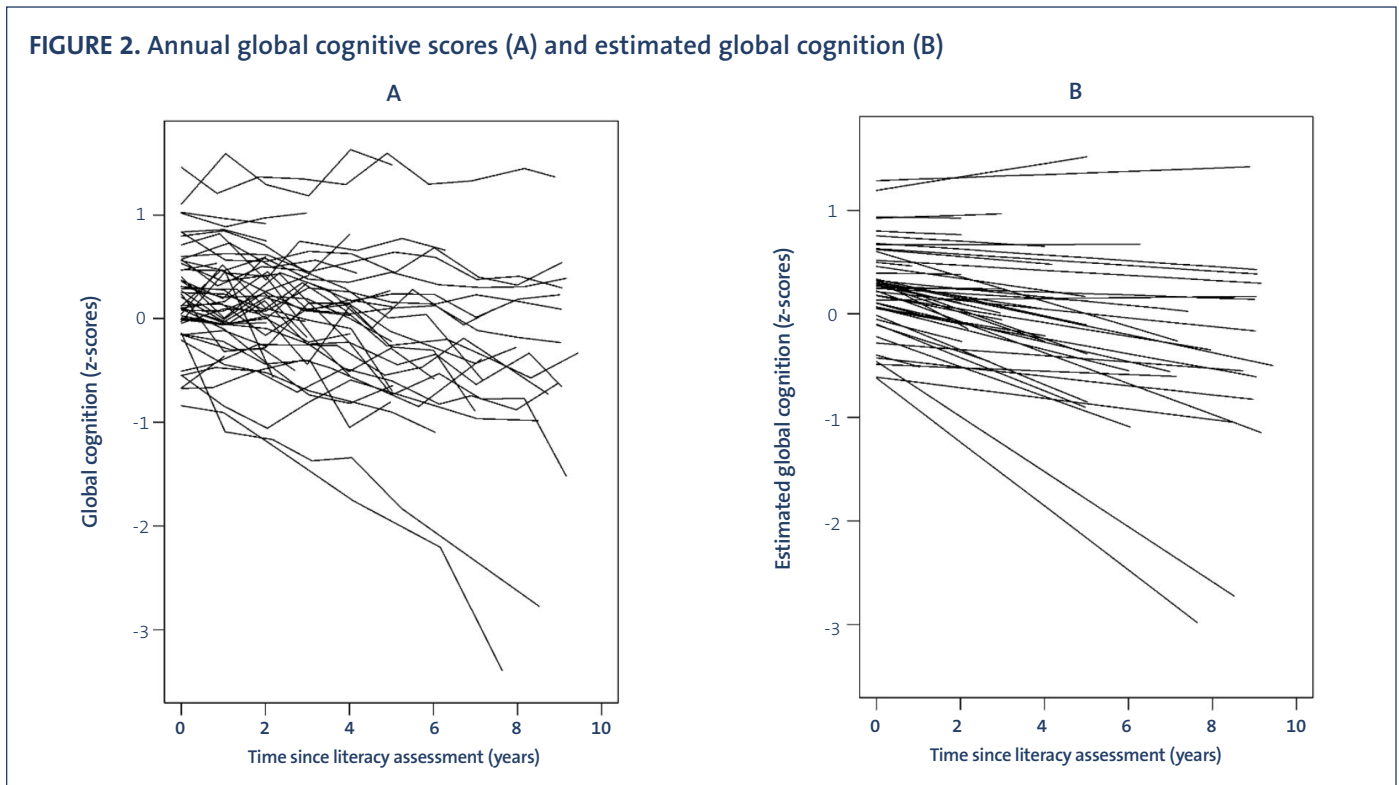
Alzheimer’s Dementia Diagnosis and Cognitive Assessment

Participants were free of dementia at the time of literacy assessment and were followed annually for Alzheimer’s dementia diagnosis and cognitive assessment. Alzheimer’s dementia diagnosis was made by clinicians following a standard evaluation. The diagnosis requires a history of cognitive decline and impairment in memory and at least one other cognitive domain⁹. These annual diagnoses allow us to ascertain whether and when a participant developed Alzheimer’s dementia during the follow-up (Figure 1). We examined the association of confidence in financial literacy with the risk of incident Alzheimer’s dementia.

FIGURE 1: Survival (free of Alzheimer’s dementia) curve for the study participants



Participants were also assessed for cognitive performance each year using a battery of 19 tests. Scores for individual tests were combined to create a composite global cognitive score^a. Based on annual global cognitive scores (Figure 2A), we estimated the rate of decline in cognitive performance (Figure 2B). Using longitudinal data analysis, we examined the association of confidence in financial literacy with the rate of cognitive decline.



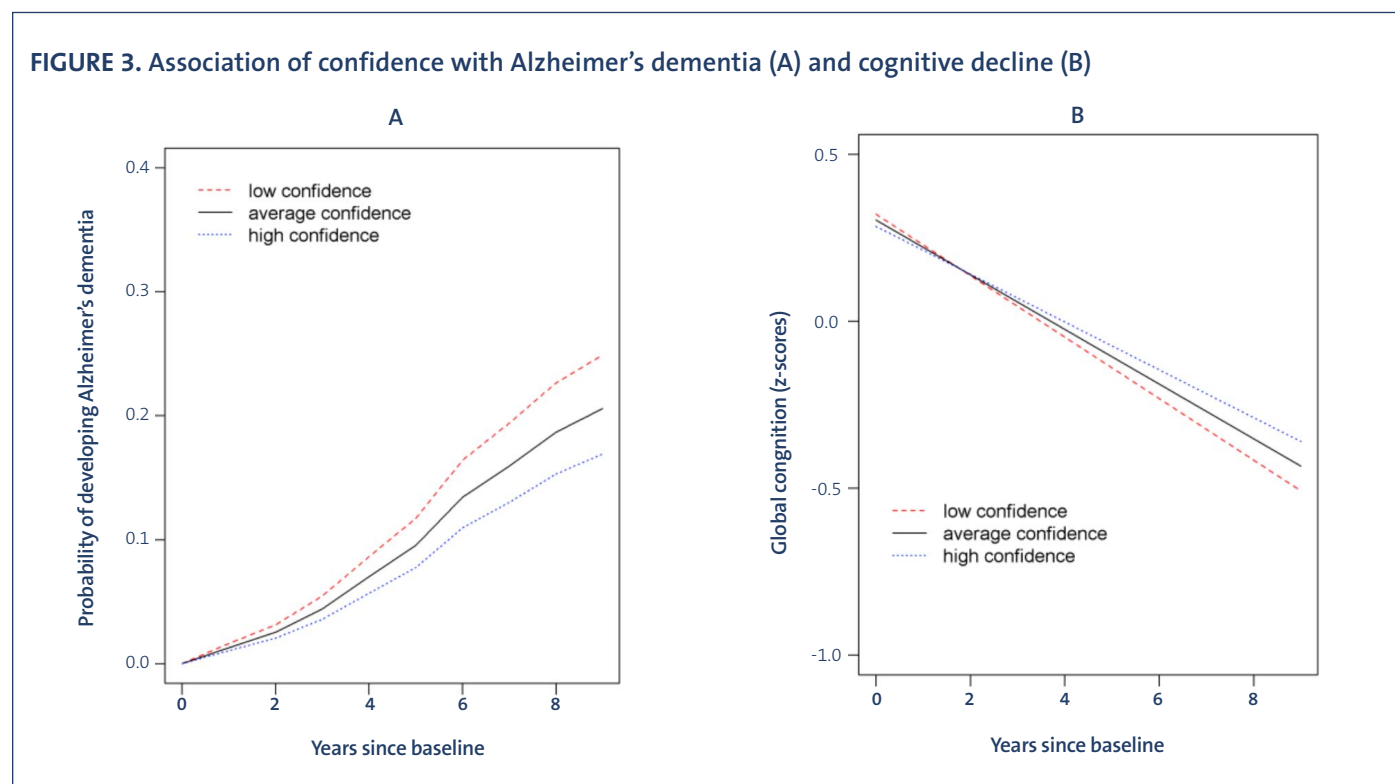
Findings

Participants on average answered 73.8% of the financial literacy questions correctly. A majority of the participants were fairly confident in their financial literacy with the mean confidence level for financial literacy being 3.1 (range 1 – 4). Higher financial literacy was correlated with higher confidence. Older females with lower education tended to have lower confidence in their financial literacy.

a. Briefly, raw scores of each test were first converted to z-scores using the baseline mean and standard deviation, and z-scores were averaged across tests to obtain the global cognitive score.

Higher confidence is associated with better cognitive health.

During the follow-up, 175 (18%) participants developed Alzheimer's dementia. Both financial literacy and confidence in financial literacy were associated with lower risk of Alzheimer's dementia. For every 1 SD increase in financial literacy, the risk of developing Alzheimer's dementia was reduced by over 40%. Separately, for every 1 SD increase in confidence of financial literacy, the risk of developing Alzheimer's dementia was reduced by about 20% (Figure 3A). Similarly, both financial literacy and confidence in financial literacy were associated with slower decline in cognition. For a 1 SD increase in financial literacy, the annual rate of cognitive decline was reduced by about 25%. With 1 SD increase, the annual rate of cognitive decline was reduced by about 12% (Figure 3B).



Domain-specific confidence, not general confidence, matters.

Separate from the measure for confidence in financial literacy, participants were also asked to rate how confident they are in general using a 10-point scale with 1 indicating not at all confident and 10 indicating completely confident. The average level of general confidence among the participants was toward the upper end (Mean=7.2). We did not observe an association of general confidence with either Alzheimer's dementia or cognitive decline, suggesting that the association of confidence with cognitive health is likely domain specific.

Underconfidence is associated with adverse cognitive health.

Older persons tend to be overconfident relative to their actual financial literacy¹⁰. Overly confident adults are more likely to engage in suboptimal financial behaviors¹¹ and less likely to seek financial advice¹², both of which may undermine financial well-being. However, there are also studies that support the benefit of confidence regardless of actual financial literacy¹³. We examined underconfidence and overconfidence in relation to cognitive health.

We determined underconfidence and overconfidence by examining how far self-reported confidence deviated from the expected confidence level given a participant's actual level of financial literacy^b. Approximately 78% of the participants rated their confidence in financial literacy comparably to the level predicted by their actual financial literacy, while 13% of the participants were underconfident and 9% were overconfident. Compared with participants whose confidence was comparable to the level predicted by actual literacy, underconfident participants had a higher risk of developing Alzheimer's dementia. We did not observe a difference in risk for overconfident participants. Underconfident participants also had faster cognitive decline, but overconfident participants did not.

Discussion

What people actually know and what they believe they know are distinct concepts. This research investigated the associations of confidence in financial literacy with cognitive health in nearly 1,000 community-dwelling older persons. We found that, in addition to objectively measured financial literacy, older persons with higher confidence tend to have better cognitive health. Further, older persons who are underconfident are more likely to develop Alzheimer's dementia and have faster cognitive decline. These findings did not systematically vary by sex.

Financial literacy affords older adults with the information and skills necessary to make sound financial decisions, which can lead to better financial outcomes and serves as an important driver of decision-making. Older adults with higher literacy also are less likely to engage in behaviors that lead to adverse health outcomes including cognitive impairment and dementia. The basis of the relationship between confidence in literacy and cognitive health is not entirely clear. Based on social cognitive theory¹⁴, self-efficacy influences how people utilize their knowledge in action. Confident individuals have strong beliefs in their own knowledge

and tend to visualize success; they expect to see that their actions will produce the expected (positive) outcome. Confident people are motivated to engage with the world and actively seek to acquire new information. Further, in the face of distraction and setbacks, confident people are more persistent and tend to exert greater effort toward meeting their goals^{15,16}. Of note, the current study did not observe an association with cognitive outcomes using a general confidence measure, suggesting that interventions to improve confidence in domain specific literacy (not just general confidence) may promote positive financial and health-related outcomes including successful cognitive aging.

While confidence provides psychological resources to promote motivation and persistency in financial and health decision-making, overconfidence has been linked to risky financial behaviors and suboptimal financial outcomes^{11,17}. This research finds that older persons who are underconfident are more likely to have poorer cognitive health. This result further strengthens our conclusion that literacy and confidence in literacy play distinct roles in promoting cognitive health. Regardless of the actual level of literacy, underconfidence may prevent individuals from actively seeking information and setting high goals or making great efforts to achieve optimal outcomes. While we did not observe a significant association of overconfidence with cognitive health in this research, future studies are warranted to confirm this lack of association.

This research finds that financial confidence has a positive impact on cognitive health that is complementary to a person's actual financial literacy level. This finding has important public health implications. First, education and outreach programs aimed to increase financial and health literacy are important to preserve cognitive health among older persons. Second, initiatives targeting soft psychological skills such as confidence could benefit cognitive well-being as well.

b. To determine overconfidence and underconfidence, the confidence measure was regressed on actual literacy measure such that the residuals capture the deviation of self-reported confidence from the regression line, which represents the mean confidence level predicted by actual literacy. We classify persons as overconfident if the residuals were >1 unit above the regression line and underconfident if the residuals were <1 unit below the regression line. The window in between captures the majority of data mass, reflecting our assumption that participants rate their confidence level generally in accordance with their literacy performance.

Acknowledgement

Funding for this study comes from National Institute on Aging Grants (R01AG17917, R01AG33678, and R01AG34374) and the FINRA Investor Education Foundation. This study is not possible without the contributions of all the participants from the Rush Memory and Aging Project, as well as investigators and staff at Rush Alzheimer's Disease Center (RADDC). The authors would also like to thank Claire Fleischer, Elizabeth Morris Lakes, and Shari Crawford from FINRA for editing and designing the issue brief. All results, interpretations, and conclusions expressed are those of the research team alone, and do not necessarily represent the views of the National Institute on Aging, FINRA Investor Education Foundation or any of its affiliated companies.

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