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HOW DOES AGING AFFECT FINANCIAL DECISION MAKING?

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Introduction

With the shift from defined benefit pensions to 401(k) plans, the welfare of retirees increasingly depends on their ability to make sound financial decisions. This situation has raised concerns that the cognitive decline that comes with age could compromise the elderly's decision-making ability and thereby their financial well-being. This *brief,* based on a recent study,[1] addresses this issue using a unique dataset that follows a group of elderly individuals over time.

The discussion proceeds as follows. The first section reviews the literature. The second section describes the dataset and the sample used in the study. The third section estimates the effect of declining cognition on three aspects of financial decision making: financial literacy, confidence in the individuals' ability to make financial decisions, and responsibility for managing the individuals' finances. The final section concludes that declining cognition has a noticeable adverse effect on financial literacy, but not on individuals' confidence in managing their finances. Perhaps not surprisingly then, more than half of those experiencing a significant cognitive decline retain primary responsibility for managing their finances.

Aging and Financial Decision Making

Cognition declines with age, and several recent studies have assessed the effect of cognitive decline on financial decision making.[2] One study finds that financial literacy scores decline by about 1 percent per year after age 60.[3] Other studies find declines in financial decision making, whereby older individuals exhibit less investment skill in one instance and suboptimal credit behavior in another.[4]

These studies base their conclusions on a comparison of financial literacy and decision-making ability of individuals of different ages. This approach runs the risk, however, of confounding the effects of cognitive decline with other factors, especially cohort effects. For example, the early-life economic conditions of different cohorts have been shown to affect risk-taking decades later,[5] and differences in risk-taking affect financial decision making. The most effective way to overcome cohort effects is to follow a panel of individuals over time. The study summarized in this *brief* adopts this approach to analyze how declining cognition affects the financial decision making of aging individuals.

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Data Description and Sample Characteristics

The data used in the analysis come from the Rush Memory and Aging Project (MAP), an ongoing study of aging individuals in the Chicago metropolitan area.[6] Since 1997, when MAP was initiated, the project has conducted yearly interviews and detailed clinical evaluations of the same panel of individuals. The annual MAP evaluation includes 19 tests to assess cognition. Scores on each test are standardized based on the mean and standard deviation of the initial scores of MAP participants in 1997; the mean score for this group is set at 0 with a one-unit change equal to the standard deviation. The average of each participant's scores on the 19 tests provides a measure of overall cognition in a given year. Changes in this overall score over time provide a measure of cognitive change as each participant and the whole group ages.

Since 2010, the annual evaluation has included a module that gathers information on three aspects of financial decision making: financial literacy, confidence, and responsibility for making financial decisions. This information can be used to identify the effect of cognitive decline on the decisionmaking process: 1) whether declining cognition reduces financial literacy, and thereby the ability to make sound decisions; and 2) if so, whether those with declining cognition lose confidence in their ability to manage their money; and 3) whether they are more likely to get help in managing their finances.

The study excludes individuals who were diagnosed with dementia at the time of their first decision-making assessment. It also excludes participants who did not complete at least two assessments, needed to measure change over time, over the two or three years for which data are available for the particular individual. Of the 575 such participants without dementia who completed at least two assessments, the cognition scores of about 66 percent declined.

Table 1 presents key characteristics of this group of 377 individuals at the time of their initial decision-making assessment. The sample was mostly female, reasonably well-educated, and 83 years old, on average, at the time of their initial decision-making assessment. These characteristics are quite similar to those of MAP participants whose cognition scores did not decline.[7] The two groups actually had identical average cognition scores at their initial decision-making assessment. The scores of the 377 individuals with declining cognition then fell 0.29 standard deviations, on average, over the period under review while those of the remaining 198 participants either remained the same or even increased.

Table 1. Initial Characteristics of Participants Whose Cognition Declined

Number of participants	377
Percent female	78%
Educational attainment	15.2 years
Age	83.2 years

Source: Gamble et al. (2014).

The decision-making assessment provided data on the three elements of financial decision making identified above:

- *Financial literacy*. The assessment asks nine questions testing numeracy and seven testing financial knowledge – capabilities that declining cognition is likely to adversely affect. The numeracy questions range in difficulty from elementary calculations to understanding compound interest. The financial knowledge questions ask whether the participant knows what the initials FDIC represent and test whether they understand issues such as the value of paying off credit card debt, the relationship between bond prices and interest rates, and historical differences between stock and bond returns. The percent of questions answered correctly in each category, and in both categories combined, is used as the measure of numeracy, financial knowledge, and overall financial literacy.[8]
- *Confidence*. The assessment asks participants to assess their overall self-confidence and their confidence in managing "day to day financial matters." After each financial knowledge question, they are also asked how confident they are in their answer. The average of these responses is used as the measure of confidence that participants have in their financial knowledge. These confidence measures are reported on a scale from 1 to 10, where 1 is not at all confident and 10 is extremely confident.

- *Responsibility for the participant's financial decisions.* The assessment asks participants who is primarily responsible for making their financial decisions – participants themselves, their spouse, their child, or someone else. They are also asked if they get help with their finances, and if so from whom.

The results of the initial assessment for the individuals whose cognition would decline are given in Table 2.

Table 2. Initial Assessment for Participants Whose Cognition Declined

Financial literacy	Percentage of questions answered correctly
Overall financial literacy	69.3%
Numeracy	69.6
Financial knowledge	68.9
Confidence	**Response on 0-10 scale[a]**
Self-confidence	7.2
Confidence in financial knowledge	6.9
Confidence in managing finances	8.1
Responsibility for financial decisions	**Percentage of respondents**
Participant primarily responsible	87%
Participant gets help	45
Gets help from someone other than a spouse	29

[a] 1 is "not at all confident" and 10 is "extremely confident."
Source: Gamble et al. (2014).

At the time of their initial assessment, individuals in this group answered about 70 percent of both the numeracy and financial knowledge questions correctly. The higher level of education of the MAP sample likely explains why this result is better than that of older people in general.[9] The group was reasonably self-confident; reasonably confident in their financial knowledge; and even more confident in their ability to manage their finances. Consistent with this high degree of confidence, the vast majority indicated that they were primarily responsible for managing their finances. Nevertheless, nearly half got help with their finances; and nearly 30 percent got help from someone other than their spouse, such as an adult child or a professional advisor.[10]

Declining Cognition and Financial Decision Making

The study then estimated the effect of cognitive decline on the three areas of financial decision making listed in Table 2: financial literacy, confidence and responsibility for financial decisions. To compute the effects, the study ran nine regressions estimating the following equation:

$$\Delta y_i = a * \Delta Cognition_i + b + \varepsilon_i$$

where $\Delta Cognition_i$ is the decline in the participant's cognition score; a is the effect of a one-unit decline in cognition on y, the specific element in the decision-making process; and b is a constant. The results are presented in Table 3 on the next page.

The regression results indicate that a one-unit decline in cognition has a significant effect on financial literacy. This effect also gives some sense of the magnitude of such a one-unit change in cognition. In the group of MAP participants whose cognition declined, a one-unit decline in cognition would reduce the average number of financial literacy questions answered correctly from nearly 70 percent to about 60 percent.[11] The result is not dementia. But it does suggest a significant decline in the ability to manage retirement savings, which is becoming increasingly important due to the decline in Social Security benefits – relative to pre-retirement income – and the shift from defined benefit pensions to 401(k)s.

In the group of MAP participants whose cognition scores declined, the average decline was 0.29 standard deviations – much less than a one-unit change. That decline, however, occurred in just two to three years. The cognitive decline that comes with age typically continues over many years. Thus a significant number of elderly individuals may experience something akin to such a one-unit decline in cognition.

Table 3. Estimated Effect of a 1-Unit Decline in Cognition on the Three Decision-Making Elements Tested, for Participants Whose Cognition Declined

	At inital assessment	After 1-unit decline in cognition[a]
Financial literacy	Percentage of questions answered correctly	
Overall financial literacy	69.3%	61.5%***
Numeracy	69.6	61.1 ***
Financial knowledge	68.9	62.1 **
Confidence	Response on 0-10 scale[b]	
Self-confidence	7.2	6.5 ***
Confidence in financial knowledge	6.9	6.6 *
Confidence in managing finances	8.1	8.0
Responsibility for financial decisions	Percentage of respondents[c]	
Participant primarily responsible	87%	55%***
Participant gets help	45	61 **
Gets help from someone other than a spouse	29	46 **

[a] The change is significant at the 10-percent (*), 5-percent (**), or 1-percent (***) level.
[b] 1 is "not at all confident" and 10 is "extremely confident."
[c] Because the dependent variables in this subsection are binary, the regression takes on a logistic form.
Source: Gamble et al. (2014).

The regression results associate such a one-unit decline in cognition with a noticeable drop in self-confidence. Confidence in financial knowledge, however, declines much less. Even more striking, the decline in cognition has essentially no effect on the participants' confidence in managing their finances. Confidence in managing one's finances was high at the initial decision-making assessment, and it remained high. Older individuals thus fail to recognize the detrimental effect of declining cognition and financial literacy on their decision-making ability.

The results also associate a one-unit decline in cognition with a large and statistically significant increase in the likelihood of getting help with financial decisions. This is the case even though declining cognition has essentially no effect on individuals' confidence in managing their finances. It is not clear, however, whether this help was sought or provided unsolicited, or whether the help received was beneficial or not. The results also indicate that over half of those experiencing a one-unit decline in cognition remain primarily responsible for their finances; and over half get no help with their finances from someone other than their spouse.[12]

Conclusion

This study uses a unique dataset that follows a panel of elderly individuals, with an average age of 82, to assess the effect of declining cognition on financial decision making. The findings confirm that declining cognition, a common occurrence among individuals in their 80s, is associated with a significant decline in financial literacy. The study also finds that large declines in cognition and financial literacy have little effect on an elderly individual's confidence in their financial knowledge, and essentially no effect on their confidence in managing their finances. Individuals with declining cognition are more likely to get help with their finances. But the study finds that over half of all elderly individuals with significant declines in cognition get no help outside of a spouse. Given the increasing dependence of retirees on 401(k)/IRA savings, cognitive decline will likely have an increasingly significant adverse effect on the well-being of the elderly.

Endnotes

1 Gamble et al. (2014).

2 Samanez-Larkin and Knutson (2014) provides a recent summary of much of this work. Also see the articles collected in Li, Ridderinkhof, and Samanez-Larkin (2011) and Samanez-Larkin (2011).

3 Finke, Howe, and Huston (2011).

4 See, respectively, Korniotis and Kumar (2011) and Agarwal et al. (2009).

5 Malmendier and Nagel (2011).

6 Bennett et al. (2012).

7 The latter group was also mostly female (75 percent), just a bit younger (on average, 80.3 years old), and also reasonably well-educated (14.9 years of schooling).

8 This study did not use two financial knowledge questions in the module because their wording varied from standard presentations. The exact wording of the questions used in this study is available as an "Online Appendix" at: http://condor.depaul.edu/kgamble.

9 The MAP decision-making assessment asks two questions that match questions asked in the *Health and Retirement Study* (HRS), a nationally representative survey of older Americans, and 65 percent of these MAP participants answered both questions correctly. By contrast, only 50 percent of HRS respondents answered both questions correctly (Lusardi and Mitchell 2011).

10 The financial literacy and confidence of MAP participants whose cognition would not decline was much the same, as was the extent to which they were primarily responsible for managing their finances. However, fewer got help with their finances (33 percent vs. 45 percent), and fewer got help from someone other than a spouse (17 percent vs. 29 percent).

11 The MAP evaluation tests five cognitive domains: episodic memory (memory of specific events), perceptual speed (the ability to process information quickly and make mental comparisons), semantic memory (knowledge of concepts), visuospatial ability (understanding visual representations and the spatial relationships among objects), and working memory (the ability to store and process transitory information). Declines in numeracy are most strongly associated with a drop in episodic memory and visuospatial ability. Declines in financial knowledge are most strongly associated with a drop in semantic memory.

12 The study's estimates are based on an analysis of changes in cognition and these three elements of financial decision making over a short period of time. But this result is confirmed by examining MAP participants who experienced statistically significant declines in cognition over the entire span of their participation in the project since 1997. Only about half of these individuals – 76 out of 146 participants experiencing such large declines – are getting help with their finances.

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