Financial literacy and confidence - an information provision experiment*

Pre-Analysis Plan

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Abstract

Research on financial literacy shows that women and older people have significantly lower levels of financial literacy. This has implications for investment and savings decisions, especially in light of an increasingly complex financial system and the growing need for individual retirement planning. Confidence can be a driving force in answering financial literacy questions and in financial decision making. For example, older individuals continue to show high levels of confidence in financial decision making, despite declining financial literacy scores at older ages (Finke et al. 2017). In addition, women have less confidence in their own abilities with regard to financial matters (Lusardi and Mitchell 2014). We would like to make the following contributions to the literature: We want to address the question of whether certain information about gender or age differences in mathematical competencies in everyday life has an impact on their confidence in answering financial literacy questions. Furthermore, we want to investigate how this information affects the hypothetical investment or savings decisions of the respective groups. We also want to analyze how this information affects preferences for policies aimed at reducing these disparities. Through our study, we aim to provide a nuanced picture of financial literacy and resulting hypothetical investment and savings decisions in the context of individual confidence in their own decisions.

Keywords: survey experiment, financial literacy, confidence, demand for education, demand for information

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1 Motivation

Financial literacy can be an important predictor of financial behavior and retirement savings. According to Lusardi and Mitchell (2014), women have significantly lower financial literacy scores compared to men. In addition, women are more likely to answer "I do not know". These findings persist across countries, levels of economic development, education and age, among others. In addition, Bucher-Koenen et al. (2016) find that women are less confident in their answers than men. The authors suggest that the gender gap in financial literacy is a combination of lower levels of knowledge and confidence. This has implications for investment and savings decisions, especially in light of an increasingly complex financial system and a greater need for individual retirement planning.

Another vulnerable group is the elderly. Given that they are likely to have made more financial decisions than younger people, they should be comparatively more financially literate. However, studies suggest that financial literacy tends to decline with age due to declining cognitive abilities. At the same time, older people still consider themselves to be confident in their financial decision-making (Finke et al. 2017, Lusardi and Mitchell 2014).

Therefore, we want to explore whether information about everyday math skills can affect the performance and confidence of different groups (gender and age) in answering financial literacy questions. A second objective of this study is to analyze how this information affects hypothetical investment and savings decisions. Finally, we want to investigate how this information affects individual demand for information and education.

In this study, we contribute to the literature on gender and age differences in basic skills and confidence, as well as to the literature on financial literacy. We conduct a survey experiment in which two random subsets of respondents receive information about either gender or age differences in everyday mathematical literacy. The active control group receives information that the everyday mathematical competencies of Germans are comparable to the OECD average. With this experiment, we want to explicitly test whether presenting statistical information can influence confidence and response behavior to financial literacy questions.

2 Experimental Design

Respondents are randomly assigned to three groups: an active control group and two treatment groups. The three experimental groups differ only in the information they receive, and randomization is done by computer.

2.1 Step 1: Elicitation of Prior Beliefs

To understand whether respondents anticipate the differences expressed by the information treatment, we elicit their prior beliefs by asking them who they think has better everyday mathematical competencies. We ask separate questions for women and men and for old and young people. We also ask them how they think Germany ranks in an international comparison. In addition, respondents are asked to explain their reasoning.

2.2 Step 2: Provision of Information

We provide information about everyday mathematical skills in Germany to all three groups in the following way.

- T1 - Age: In Germany, younger adults have higher everyday mathematical skills than older adults.
- T2 - Gender: In Germany, men have higher everyday mathematical skills than women.
- C - Active control: In an international comparison, adults in Germany have average everyday skills.

For this information, we are using information from the most recent PIAAC study from 2012 for Germany. (Rammstedt 2013).

2.3 Step 3: Outcome Variables

In our survey, we have the following sets of outcome variables:

1. Confidence in their own financial literacy and financial literacy performance
2. Hypothetical investment and savings decisions
3. Demand for information and education

Confidence in their own financial literacy and financial literacy performance

Financial Literacy Performance: We measure financial literacy using the "Big 3" financial literacy questions established by Lusardi and Mitchell (2008). The financial literacy questions are used to calculate a financial literacy score for each individual, where a respondent receives one point for each correct answer and zero points for an incorrect answer or a "do not know" response. Each respondent can therefore earn a maximum of 3 points.

Share of "do not know": We calculate for each respondent a score that indicates the share of "do not know" answers.

Confidence per answer: After each financial literacy question, we ask respondents how confident they are in their answer. We evaluate the impact on this score individually and in a combined score.

Perceived share of correct answers: After the financial literacy questions, respondents are asked how many questions they think they answered correctly. They can choose between 0, 1, 2, or 3 correctly answered questions.

Own performance in comparison: Finally, we ask respondents "Compared to the German population, how many people do you think answered more questions correctly than you did?".

Consequently, low confidence will be indicated by 1) a high share of "do not know" answers, 2) low certainty in their answers, 3) a low estimate about the share of correct answers, 4) a pessimistic assessment of one's own performance in comparison.

Hypothetical investment and saving decisions

Respondents are asked how they would allocate a hypothetical lottery win of EUR 100,000. They can choose from the following options In a savings account or cash, in a private pension, in shares/funds/ETFs, for immediate consumption (e.g. vacation), as a gift to relatives, as a gift to others, or as a donation.

Demand for information and education

In the third set of outcome variables respondents are asked the following questions about their demand for information and education.

- Even after leaving school, the state should ensure that all citizens are provided with regular information on saving and old-age provision.
- A federal government online platform on financial literacy is a good way to keep up with the financial system.
- Financial literacy courses are a good way to keep up with the financial system.
- I see a great need for me to attend a financial literacy course.
- There should be a greater focus on financial literacy in schools.
- Private old-age provision should be left to each individual and the state should not interfere in this.

3 Sample and Data

The data will be collected in November 2023 via an online survey distributed by a professional survey company. All German citizens aged 18 and over are eligible to participate. The sample is intended to be quota representative in terms of age, gender, education and residence in East/West Germany. The targeted sample size is 2500 respondents. This sample size allows us to detect treatment effects of around 14 percent of a standard deviation at a 0.05 significance level with a statistical power of 0.8.

4 Hypotheses

We expect to find an average treatment effect that is close to zero because we expect the respective subgroups to show opposite reactions to the treatments. Thus, our hypotheses are as follows:

Confidence

Hypothesis Ia - Confidence: Age: Older[1] respondents will be less confident when learning that their group has lower everyday mathematical competencies.

Hypothesis Ib - Confidence: Gender: Women will be less confident when learning that their group has lower everyday mathematical competencies.

Hypothetical investment and Savings Decisions

[1] Older respondents are aged 45 years and above.

Hypothesis IIa - Hypothetical investment and saving decisions: Age: Older respondents will allocate money from a hypothetical lottery win more towards less risky and less financially profitable options, when learning that their group has lower everyday mathematical competencies.

Hypothesis IIb - Hypothetical investment and saving decisions: Gender: Female respondents will allocate money from a hypothetical lottery win more towards less risky and less relatable options, when learning that their group has lower everyday mathematical competencies.

Demand for information/ policies:

Hypothesis IIIa- Demand for information and education: Age: Older respondents will have a higher demand for information and education when learning that their group has lower everyday mathematical competencies.

Hypothesis IIIb- Demand for information and education: Gender: Women will have a higher demand for information and education when learning that their group has lower everyday mathematical competencies.

5 Analysis

5.1 Balance

To see whether randomization was successful, we will conduct t-tests to compare the control and treatment groups. They will be conducted on the following variables:

- age
- gender
- residency in East/West Germany
- education
- risk attitude
- trust in public institutions
- trust in statistics
- patience
- marital status
- employment status
- household income
- household size
- migration background
- political affiliation
- prior beliefs

- savings behavior

5.2 Treatment Effect of Information Provision

We estimate the treatment effect by using the following equation:

$$y_i = \gamma_0 + \gamma_1 Treat_{ij} \times H_{ij} + \gamma_2 Treat_{ij} + \gamma_3 H_{ij} + \gamma^T X_i + \varepsilon_i \tag{1}$$

where y_i denotes the outcome variables, $Treat_{ij}$ indicates whether respondent i is in either the age ($j = 1$) or the gender ($j = 2$) treatment group, H_{ij} denotes the interacted heterogeneity dimension of interest, X_i denotes the control variables and ε_i is the error term. Control variables will include the variables that are also used for the balance test as described in Section 5.1.

Furthermore, we are considering to use a data-driven approach to investigate further areas of heterogeneity.

5.3 Multiple Hypothesis Testing

To take multiple hypothesis testing into account we will calculate indices based on our outcome variables, combining confidence measures into one index and demand for information and education into another index.

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