Beyond Knowledge:

Confidence and the Gender Gap in Financial Literacy

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Roadmap

Motivation

Setup

Results: Financial Literacy Measurement

Results: Financial Behavior

Conclusion

Motivation

- Women face particular financial challenges: higher life expectancy, lower lifetime income, more frequent career interruptions
- Financial literacy linked to sound financial decision-making (Lusardi & Mitchell, 2011, 2014, 2023)
- However: persistent gender gap in financial literacy around the world, even at young ages (Bottazzi & Lusardi, 2021; Bucher-Koenen et al., 2016; Driva et al., 2016; Klapper & Lusardi, 2019)
- Women less confident in their knowledge, especially regarding financial matters (Bannier & Schwarz, 2018; Coffman, 2014a, 2014b; Webster & Ellis, 1996)
- Perceived knowledge & confidence relevant for financial decision making, esp. for women (Allgood & Walstad, 2015; Anderson et al., 2017; Bannier & Neubert, 2016; Lusardi & Mitchell, 2017)

Contribution

We extend & simplify approach of Bucher-Koenen et al. (2021):

- Survey experiment: forced responses, follow-up questions on confidence

- Design: between subjects instead of within-subjects

- Adjust for guessing $\rightarrow$ no latent class model to estimate "true knowledge"

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Contribution to literature on financial literacy measurement (Aristei & Gallo, 2022; Chen & Garand, 2018; Davoli, 2023; Hospido et al., 2024; Kaiser et al., 2023; Ranyard et al., 2020; Tinghög et al., 2021)

- propose design & method to disentangle knowledge & confidence
- both dimensions are associated with financial behavior
- simple & cost-efficient, applicable in cross-sectional studies

Roadmap

Setup

Between-subjects experiment

- Randomized survey experiment in Germany, 4,927 respondents aged 30+, interviewed Oct–Dec 2020

- "Big-3" financial literacy questions & two debt literacy questions (Lusardi & Mitchell, 2011; Lusardi & Tufano, 2015)

Control (75%)

- Standard mode, incl. "do not know" (DNK) and refusal

Treatment (25%)

- Forced answers: no DNK or refusal

- Follow up: *"How confident are you about your answer?"* (11-point Likert item) + *"I don't know, I guessed"*
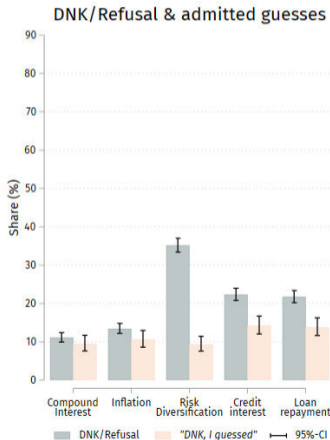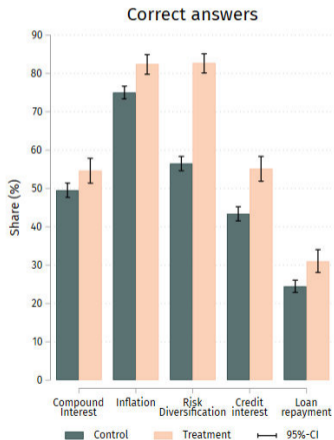
Roadmap

Results

Correct answers & DNK/Refusal across experimental conditions

Correct answers

DNK/Refusal & admitted guesses

Control — Treatment — 95%-CI

DNK/Refusal — "DNK, I guessed" — 95%-CI

- More correct answers in treatment
- Less admitted guessing than DNK/Refusal
- But: forced answers include noise in treatment

▸ surveys   ▸ Tests: FLQs

Results

"Raw" and "adjusted" financial literacy
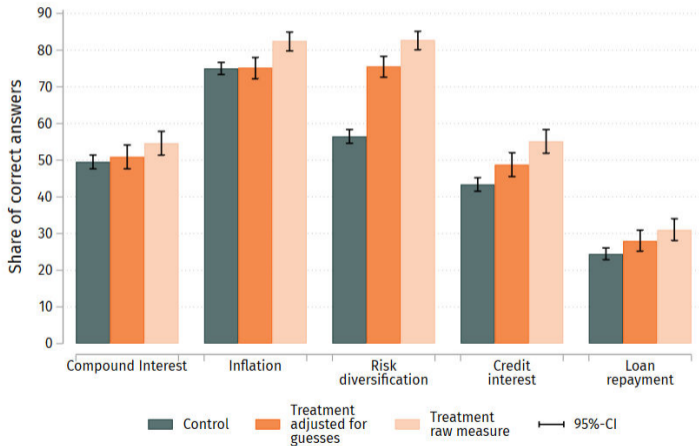
- Remove noise: adjust for **guessing**
- More correct answers for 3 out of 5 questions
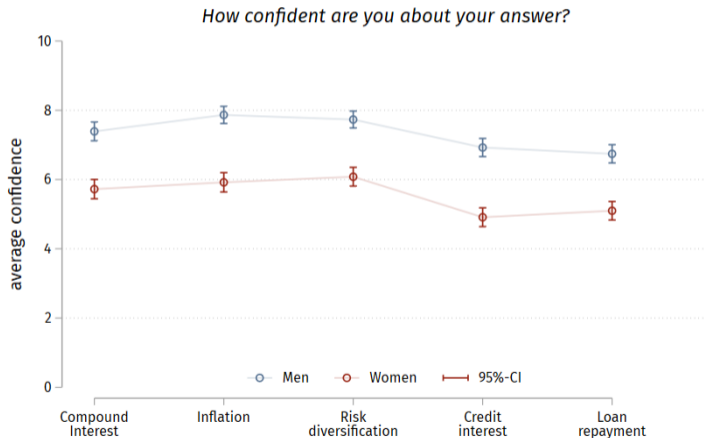
Results

Gender gap in financial literacy

	(1) Big-3 (raw)	(2) Big-3 (adj.)	(3) All FL (raw)	(4) All FL (adj.)
Female	-0.402***	-0.402***	-0.723***	-0.723***
	(0.0301)	(0.0302)	(0.0443)	(0.0443)
Treatment	0.191***	0.0750	0.330***	0.137*
	(0.0401)	(0.0431)	(0.0614)	(0.0657)
Female $\times$ Treatment	0.248***	0.147*	0.303***	0.180*
	(0.0548)	(0.0596)	(0.0806)	(0.0873)
Socioecon. controls	YES	YES	YES	YES
N	4927	4927	4927	4927
Adj. R2	0.176	0.164	0.215	0.202

Note: Robust SEs in parentheses, $^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. Socioeconomic controls incl. number of children, marital status, age, education, income, homeownership and region.

Larger difference in correct answers for women in treatment vs. control, compared to difference for men

▸ All Qs   ▸ Guessing

Results

Gender gap in confidence

How confident are you about your answer?

Women less confident across all financial literacy questions

Note: Includes information of 1,212 treated respondents that identified as male (551) or female (661).

▸ Table

Results

Gender gap in confidence

How confident are you about your answer?

Women less confident across all financial literacy questions

- Respondents with correct answer more confident
- But: confidence of incorrect men similar to correct women

Roadmap

Results

Financial literacy, gender and stock market participation
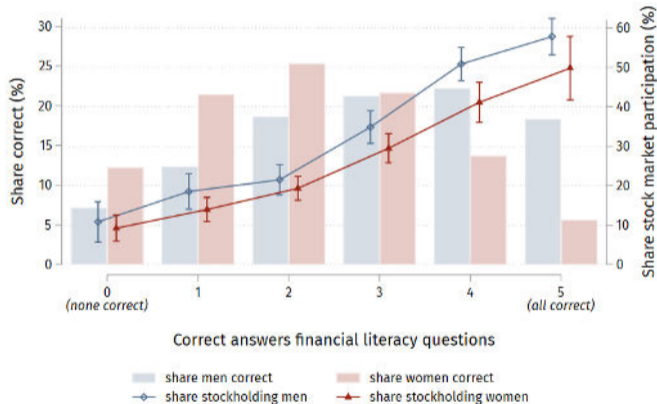
Note: The financial literacy measure based on the number of correct answers to all financial literacy questions included in the survey. For treated respondents, the measure was adjusted for admitted guesses.

Stock market participation: [a]

- positively associated with financial literacy
- lower for women across all levels of financial literacy

[a] incl. shares, equity funds & real estate funds

▸ Balance

Table: Financial literacy & stock market participation (SMP)

	(1) Control	(2) Control	(3) Treat. raw	(4) Treat. raw	(5) Treat. adj.
No. correct in 'Big-3' (std.)	0.0784***	0.0610***	0.0576***	0.0345**	0.0347*
	(0.00734)	(0.0107)	(0.0117)	(0.0120)	(0.0139)
DNK/Refusals in 'Big-3' (std.)		-0.0244*			
		(0.00953)			
Av. confidence in 'Big-3' (std.)				0.0767***	0.0677***
				(0.0131)	(0.0150)
Female	-0.0512***	-0.0498***	-0.0490	-0.0154	-0.0173
	(0.0146)	(0.0146)	(0.0261)	(0.0269)	(0.0270)
Socioecon. controls	YES	YES	YES	YES	YES
N	3715	3715	1212	1212	1212
Adj. R2	0.197	0.198	0.214	0.234	0.233

Note: Robust SEs in parentheses, $^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. Socioeconomic controls include marital status, no. of children in hh, age, education, retirement status, risk aversion, homeownership status, monthly net income, dummies for East Germany and retirement status.

- Knowledge and confidence associated with financial behavior
- Standard mode overstates association of financial literacy and SMP

FL-5   Robust: low conf.

Roadmap

Conclusion

- Results confirm financial literacy gender gap
- But: standard methodology overstates difference
- Confidence contributes to gender gap, explanatory power for financial behavior above & beyond fin. knowledge
- Our approach: disentangle knowledge & confidence, simple & efficient, applicable in cross-sectional studies
- Policy implication: closing gender gap in financial literacy & facilitate fin. inclusion may require efforts to boost confidence
- Promising pathways: confronting gender stereotypes in financial domain (Tinghög et al., 2021), stock trading interventions (Jha & Shayo, 2022)

References I

Allgood, S., & Walstad, W. B. (2015).The effects of perceived and actual financial literacy on financial behaviors. *Economic Inquiry*, *54*(1), 675–697.

Anderson, A., Baker, F., & Robinson, D. T. (2017).Precautionary savings, retirement planning and misperceptions of financial literacy. *Journal of Financial Economics*, *126*(2), 383–398.

Aristei, D., & Gallo, M. (2022).Assessing gender gaps in financial knowledge and self-confidence: Evidence from international data. *Finance Research Letters*, *46*, 102200.

Bannier, C. E., & Neubert, M. (2016).Gender differences in financial risk taking: The role of financial literacy and risk tolerance. *Economics Letters*, *145*, 130–135.

Bannier, C. E., & Schwarz, M. (2018).Gender- and education-related effects of financial literacy and confidence on financial wealth. *Journal of Economic Psychology*, *67*, 66–86.

Bottazzi, L., & Lusardi, A. (2021).Stereotypes in financial literacy: Evidence from PISA. *Journal of Corporate Finance*, *71*, 101831.

References II

Bucher-Koenen, T., Alessie, R., Lusardi, A., & van Rooij, M. (2021, April). *Fearless woman: Financial literacy and stock market participation* (NBER Working Paper No. 28723). National Bureau of Economic Research.

Bucher-Koenen, T., Lusardi, A., Alessie, R., & van Rooij, M. (2016).How Financially Literate Are Women? An Overview and New Insights. *Journal of Consumer Affairs*, *51*(2), 255–283.

Chen, Z., & Garand, J. C. (2018).On the gender gap in financial knowledge: Decomposing the effects of don't know and incorrect responses. *Social Science Quarterly*, *99*(5), 1551–1571.

Coffman, K. B. (2014a).Gender differences in willingness to guess. *Management Science*, *60*(2), 434–448.

Coffman, K. B. (2014b).Evidence on self-stereotyping and the contribution of ideas. *The Quarterly Journal of Economics*, *129*(4), 1625–1660.

References III

Davoli, M. (2023). *A, B, or C? Question Format and the Gender Gap in Financial Literacy* (Economics of Education Working Paper Series No. 0206). University of Zurich, Department of Business Administration (IBW).

Driva, A., Lührmann, M., & Winter, J. (2016).Gender differences and stereotypes in financial literacy: Off to an early start. *Economics Letters*, *146*, 143–146.

Hospido, L., Iriberri, N., & Machelett, M. (2024, January). *Gender gaps in financial literacy: A multi-arm rct to break the response bias in surveys* (Documentos de Trabajo No. 2401). Banco de España.

Jha, S., & Shayo, M. (2022).Trading stocks builds financial confidence and compresses the gender gap. *SSRN Electronic Journal*.

Kaiser, T., Lusardi, A., Mitchell, O., & Oberrauch, L. (2023). *Measuring financial literacy with the "big three"* (GFLEC Working Paper). Global FInancial Literacy Excellence Center.

References IV

Klapper, L., & Lusardi, A. (2019).Financial literacy and financial resilience: Evidence from around the world. *Financial Management*, *49*(3), 589–614.

Lusardi, A., & Mitchell, O. S. (2011).Financial literacy around the world: An overview. *Journal of Pension Economics and Finance*, *10*(4), 497–508.

Lusardi, A., & Mitchell, O. S. (2014).The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, *52*(1), 5–44.

Lusardi, A., & Mitchell, O. S. (2017).How ordinary consumers make complex economic decisions: Financial literacy and retirement readiness. *Quarterly Journal of Finance*, *07*(03), 1750008.

Lusardi, A., & Mitchell, O. S. (2023).The importance of financial literacy: Opening a new field. *Journal of Economic Perspectives*, *37*(4), 137–154.

Lusardi, A., & Tufano, P. (2015).Debt literacy, financial experiences, and overindebtedness. *Journal of Pension Economics and Finance*, *14*(4), 332–368.

References V

Ranyard, R., McNair, S., Nicolini, G., & Duxbury, D. (2020).An item response theory approach to constructing and evaluating brief and in-depth financial literacy scales. *Journal of Consumer Affairs*, *54*(3), 1121–1156.

Tinghög, G., Ahmed, A., Barrafrem, K., Lind, T., Skagerlund, K., & Västfjäll, D. (2021).Gender differences in financial literacy: The role of stereotype threat. *Journal of Economic Behavior and Organization*, *192*, 405–416.

Von Gaudecker, H.-M. (2015).How does household portfolio diversification vary with financial literacy and financial advice? *The Journal of Finance*, *70*(2), 489–507.

Webster, R. L., & Ellis, T. S. (1996).Men's and women's self-confidence in performing financial analysis. *Psychological Reports*, *79*(3_suppl), 1251–1254.

Questionnaire

Translation – "Big-3"-financial literacy questions

1. Suppose you had EUR 100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? (*More than EUR 110* / Exactly EUR 110 / Less than EUR 110)

2. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, would you be able to buy exactly the same as, more than, or less than today with the money in this account? (More / Exactly the same / *Less than today*)

3. Do you agree with the following statement: "Buying a single company stock is less risky than investing in a mutual fund with stocks of similar companies"? (I agree / *I disagree*)

Questionnaire

Translation – add. debt literacy questions

1. Suppose you take out a loan of EUR 1,000 from the bank at an interest rate of 20% per year. If you do not pay anything off, at this interest rate, how long will it take for the amount you owe the bank to double? (Less than 2 years / *2 to less than 5 years* / 5 to less than 10 years / 10 years or more)

2. Suppose you have taken out a loan of EUR 3,000 with the bank. You pay the minimum payment of EUR 30 per month to the bank. The annual interest is 12% (or 1% per month). How many years will it take to pay off this loan? (Less than 5 years / Between 5 and 10 years / Between 10 and 15 years / *Never, the debt will remain*)

Questionnaire

Original German version – "Big-3"-financial literacy questions

1. Angenommen, Sie haben 100 € Guthaben auf Ihrem Sparkonto. Dieses Guthaben wird mit % pro Jahr verzinst, und Sie lassen es 5 Jahre auf diesem Konto. Was meinen Sie: Wie hoch wird ihr Guthaben nach 5 Jahren sein? (*Höher als 110 €* / Genau 110 € / Niedriger als 110 €)

2. Angenommen, die Verzinsung Ihres Sparkontos beträgt 1% pro Jahr und die Inflationsrate beträgt 2% pro Jahr. Was glauben Sie: Werden Sie nach einem Jahr mit dem Guthaben des Sparkontos genauso viel, mehr oder weniger als heute kaufen können? (Mehr / Genauso viel / *Weniger als heute*)

3. Stimmen Sie der folgenden Aussage zu: "Die Anlage in Aktien eines einzelnen Unternehmens ist weniger riskant als die Anlage in einem Fonds mit Aktien ähnlicher Unternehmen"? (Stimme zu / *Stimme nicht zu*)

Questionnaire

Original German version – add. debt literacy questions

1. Nehmen Sie an, Sie nehmen bei der Bank einen Kredit in Höhe von 1000 Euro zu einem Zins von 20% pro Jahr auf. Wenn Sie diesen Kredit und auch die Zinsen nicht abbezahlen, wie lange dauert es, bis sich der Betrag, den Sie der Bank schulden, verdoppelt hat? (Weniger als 2 Jahre / *2 bis weniger als 5 Jahre* / 5 bis weniger als 10 Jahre / 10 Jahre oder mehr)

2. Nehmen Sie an Sie haben einen Kredit in Höhe von 3000 Euro bei der Bank aufgenommen. Sie zahlen den Mindestbeitrag von 30 Euro pro Monat an die Bank. Die jährlichen Zinsen betragen 12% (oder 1% pro Monat). Wie viele Jahre dauert es, diesen Kredit abzubezahlen? (Weniger als 5 Jahre / Zwischen 5 und 10 Jahren / Zwischen 10 und 15 Jahren / *Niemals, die Schulden bleiben bestehen*)

Setup

Data: Soziale Sicherung Survey

Survey among German-speaking resident population aged 30+ living in private households in Germany

- Field time: Oct - Dec 2020 *(Pretests: Aug-Sep 2020)*
- Phone recruitment: 1,010 participants (12% success), *next-birthday-method* to randomly select household members
- Online panel: 4,162 respondents
- *Here:* Exclude 182 P&P respondents (treatment not randomized) and 64 individuals with incomplete information on household composition and financial behavior

Setup

Fearless Woman (Bucher-Koenen et al., 2021)

- Survey experiment in DNB Household Panel (DHS)

- Based on Big-3 Financial Literacy questions

- Latent class model exploits cross-question consistency in answers to measure "true knowledge"

Balance: socioeconomic & demographic characteristics

Balancing of covariates across control and treatment condition

Note: Proportions of socioeconomic and demographic characteristics across treatment and control groups incl. logit-transformed 95%-CIs.
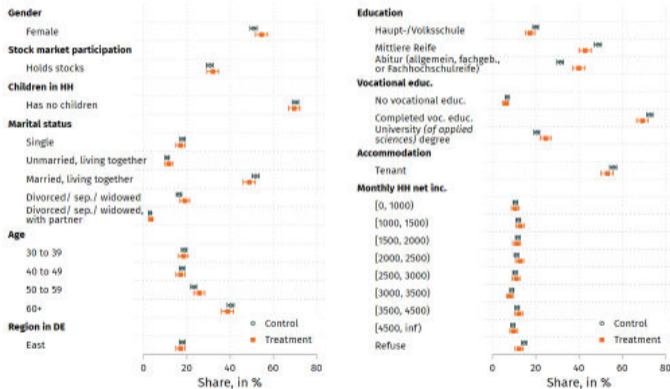
Deviation in secondary and post-secundary/non-tertiary education → regressions account for socioeconomic differences

Balance: Educational attainment across treatment and gender

	(1) "Abitur" (A-Levels)	(2) "Abitur" (A-Levels)	(3) University diploma	(4) University diploma
Female	-0.0159	0.00756	-0.0265	-0.00917
	(0.0166)	(0.0160)	(0.0145)	(0.0140)
Treatment	0.125***	0.113***	0.0825***	0.0728**
	(0.0270)	(0.0258)	(0.0246)	(0.0236)
Female × Treatment	-0.0743*	-0.0599	-0.0770*	-0.0624*
	(0.0357)	(0.0342)	(0.0311)	(0.0299)
Socioecon. controls.	No	Yes	No	Yes
N	4927	4927	4927	4927
R2	0.00868	0.107	0.00671	0.0934
Adj. R2	0.00808	0.103	0.00610	0.0895

- Imbalance in high levels of education primarily driven by men
- Educational difference across treatment and control condition for women less concerning

Note: Socioeconomic controls include no. of children, marital status, age, income, homeownership and region. $^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

Treatment effect

Overall: count measures
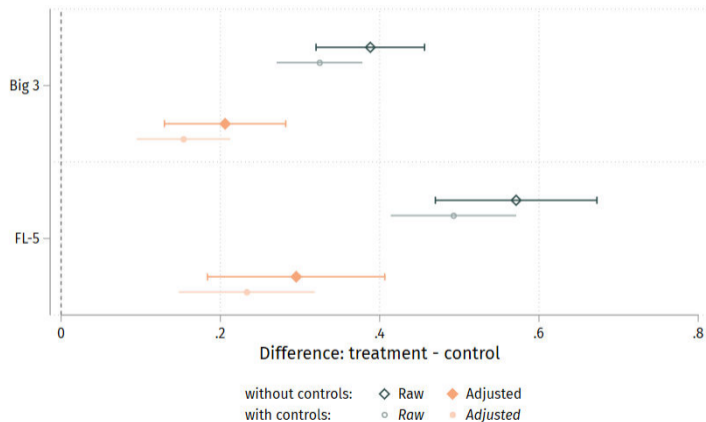
Note: Difference in number of correct answers across treatment and control conditions. Higher positive values correspond to higher number of correctly answered questions in the treatment group. Controls include gender, number of children, marital status, age, education, income, homeownership and region. 95%-CIs based on robust SEs.

- Count measures: more correct answers in treatment
- Holds when adjusting for guesses and incl. control variables

Treatment effect

All financial literacy questions
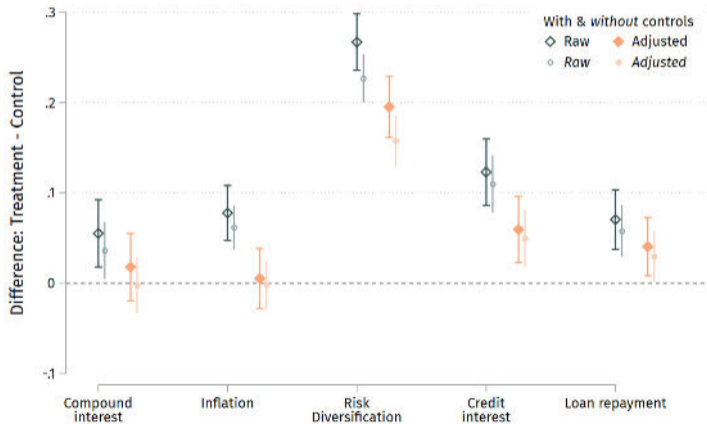
Note: Difference in share of correct answers across treatment and control conditions. Higher positive values correspond to higher number of correctly answered questions in the treatment group. Controls include gender, number of children, marital status, age, education, income, homeownership and region. 95%-CIs based on robust SEs.

Sig. more often correct...

- ... for all "raw" answers
- ... for "adjusted" risk diversification, credit interest and loan repayment questions

Table: Treatment effect across gender: all questions

	(1) q_i correct raw	(2) q_i correct raw	(3) q_i correct adjusted	(4) q_i correct adjusted
Female	-0.130***	-0.145***	-0.136***	-0.145***
	(0.00757)	(0.00885)	(0.00775)	(0.00885)
Treatment	0.0985***	0.0661***	0.0466***	0.0273*
	(0.00803)	(0.0122)	(0.00869)	(0.0131)
Female $\times$ Treatment		0.0605***		0.0359*
		(0.0161)		(0.0174)
Constant	0.453***	0.460***	0.462***	0.467***
	(0.0197)	(0.0198)	(0.0201)	(0.0203)
Socioecon. controls	YES	YES	YES	YES
N (clusters)	4927	4927	4927	4927
R2	0.0737	0.0744	0.0717	0.0720
Adj. R2	0.0728	0.0735	0.0708	0.0710

Note: SEs clustered at level of respondents and reported in parentheses, $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. Socioeconomic controls include no. of children, marital status, age, education, income, homeownership and region.

For all financial literacy questions:
More correct answers for women in treatment (vs. control) than men (in treatment vs. control)

Guessing vs. DNK/Refusal

	(1) Compound interest	(2) Inflation	(3) Risk diversification	(4) Credit interest	(5) Loan repayment
Female	0.0666***	0.0866***	0.164***	0.135***	0.114***
	(0.00985)	(0.0106)	(0.0146)	(0.0130)	(0.0131)
Treatment	0.0128	-0.0177	-0.163***	-0.0297*	-0.0377*
	(0.0123)	(0.0113)	(0.0144)	(0.0145)	(0.0147)
Female × Treatment	-0.0426*	-0.0207	-0.129***	-0.0721**	-0.0592**
	(0.0188)	(0.0191)	(0.0220)	(0.0230)	(0.0228)
Socioecon. controls.	Yes	Yes	Yes	Yes	Yes
N	4927	4927	4927	4927	4927
R2	0.0480	0.0594	0.169	0.0707	0.0596
Adj. R2	0.0432	0.0546	0.165	0.0660	0.0548

Note: LPM with robust SEs using DNK/Refusal (in control) and admitted guess (in treatment) as DV (1=DNK/Ref./guess, 0=other). $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. Socioeconomic controls include no. of children, marital status, age, education, income, homeownership and region.

- Fewer guesses than DNKs among women, compared to difference among men
- Holds for all except inflation question

Robustness: DNK/Refusal and guessing

Financial numeracy vs. treatment
Considering DNK/Refusal as random guessing

Categories (top to bottom): Compound interest, Inflation, Risk diversification, Credit interest, Loan repayment, Big-3 score, FL-5 score

Legend: ○ All, ■ Men, ◇ Women

X-axis: -.1, 0, .1, .2, .3
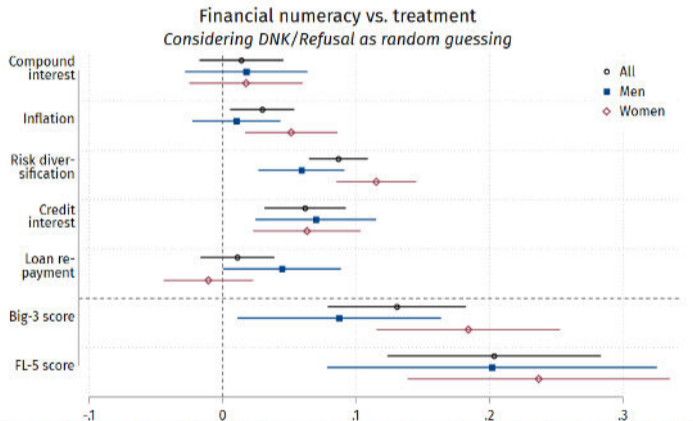
Note: Coefficients correspond to weighted t-tests of the difference between the corresponding financial numeracy score following von Gaudecker (2015) and the raw responses to the financial literacy questions among treated respondents. 95% Confidence intervals are drawn in respective colors.

- Von Gaudecker (2015): DNK/Ref ≈ guessing
- assign value of 1/(options available)
- Higher share correct than expected with random guessesing only due to forcing

Table: Confidence in answer to FL-questions

	(1) Confidence in q_i	(2) Confidence in q_i	(3) Confidence in q_i
Correct in q_i	1.557***	1.452***	1.526***
	(0.0854)	(0.0830)	(0.119)
Female		-1.206***	-1.121***
		(0.128)	(0.177)
Correct in $q_i \times$ Female			-0.132
			(0.162)
Constant	5.449***	5.948***	5.899***
	(0.370)	(0.356)	(0.367)
Socioecon. controls	YES	YES	YES
N (clusters)	1176	1176	1176
R2	0.136	0.176	0.177
Adj. R2	0.133	0.173	0.173

Note: SEs clustered at level of respondents and reported in parentheses, $^*p < 0.05; ^{**}p < 0.01; ^{***}p < 0.001$. Socioeconomic controls include no. of children, marital status, age, education, income, homeownership and region.

- Women with correct answer less confident than men with correct answer (-1.25; p=0.000)
- Women with correct answer similarly confident as incorrect men (+0.27, (p=0.097))

Table: Gender & SMP: treating low confidence as guessing

	(1) Treatment raw	(2) Treatment raw	(3) Treatment adjusted	(4) Treatment adjusted	(5) Treatment (low conf. =guess)	(6) Treatment (low conf.= guess)
No. correct in FL-5 (std.)	0.0674***	0.0463***	0.0803***	0.0517***		
	(0.0128)	(0.0133)	(0.0127)	(0.0152)		
Av. confidence in FL-5 (std.)		0.0657***		0.0516***		0.0451**
		(0.0133)		(0.0153)		(0.0166)
No. correct in FL-5 (std., low conf=guess)					0.0848***	0.0564***
					(0.0128)	(0.0167)
Female	-0.0417	-0.0154	-0.0350	-0.0192	-0.0302	-0.0187
	(0.0264)	(0.0272)	(0.0265)	(0.0272)	(0.0265)	(0.0271)
Socioecon. controls	YES	YES	YES	YES	YES	YES
N	1212	1212	1212	1212	1212	1212
Adj. R2	0.210	0.224	0.217	0.223	0.220	0.223

(2) vs. (5) and (4) vs. (6): treating low confidence as guess yields similar results

Note: SEs in parentheses, $^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. Socioeconomic controls include number of children, marital status, age, education, income, homeownership and region.

Stock market participation across treatment & gender

	(1) SMP	(2) SMP
Female	-0.112***	-0.0761***
	(-6.58)	(-5.32)
Treatment	0.0535	-0.000690
	(1.94)	(-0.03)
Female × Treatment	-0.0577	-0.00172
	(-1.65)	(-0.06)
Socioecon. controls.	NO	YES
N	4927	4927
Adj. R2	0.0193	0.180

Note: SEs in parentheses, $^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. Controls include general risk aversion, number of children, marital status, age, education, income, homeownership and region.

Gender gap in stock market participation: not different across treatment arms

Robustness: Follow-up with standard mode
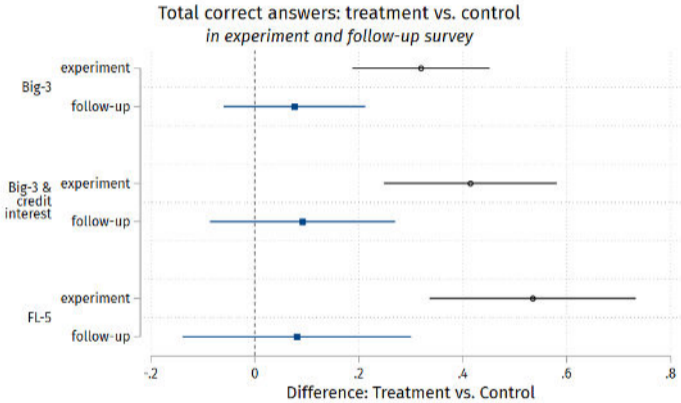
Total correct answers: treatment vs. control
in experiment and follow-up survey

Difference: Treatment vs. Control

Note: Coefficients represent difference in share of correct answers between individuals initially assigned to treatment (vs. control) in the experiment and follow-up survey, respectively. 282 of 1212 individuals in our treatment and 763 of 3715 in our control condition participated in the follow-up survey conducted between Dec. 22 and Jan. 23. 95%-Confidence intervals based on robust SEs.

Follow-up survey with subsample (12/22 -02/23)

- same questions, incl. DNK/Refusal for all participants
- No difference across treatment groups when facing same survey mode

Robustness: Follow-up with standard mode

Share of correct answers: treatment vs. control
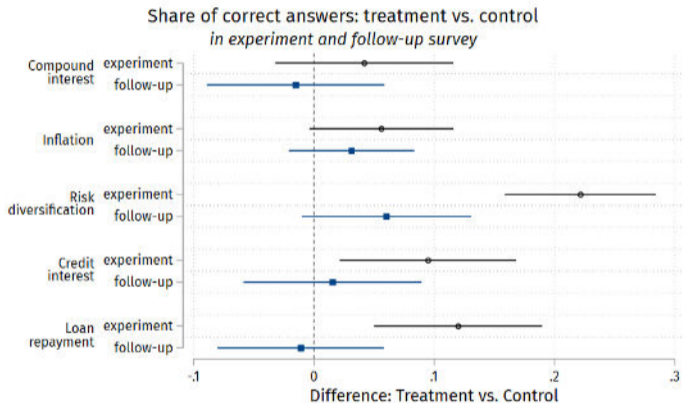*in experiment and follow-up survey*

Note: Coefficients represent difference in share of correct answers between individuals initially assigned to treatment (vs. control) in the experiment and follow-up survey, respectively. 282 of 1212 individuals in our treatment and 763 of 3715 in our control condition participated in the follow-up survey conducted between Dec. 22 and Jan.23. 95%-Confidence intervals based on robust SEs.

Follow-up survey with subsample (12/22 -02/23)

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# Financial literacy, gender and stock market participation

Robustness: FL-5

	(1) Control	(2) Control	(3) Treat. raw	(4) Treat. raw	(5) Treat. adj.
No. correct in FL-5 (std.)	0.0825***	0.0767***	0.0665***	0.0451***	0.0514***
	(0.00782)	(0.0104)	(0.0128)	(0.0133)	(0.0152)
DNK/Refusals in FL-5 (std.)		-0.00869			
		(0.00868)			
Av. confidence in FL-5 (std.)				0.0661***	0.0519***
				(0.0133)	(0.0153)
Female	-0.0432**	-0.0428**	-0.0374	-0.0113	-0.0149
	(0.0148)	(0.0148)	(0.0263)	(0.0270)	(0.0269)
Socioecon. controls	YES	YES	YES	YES	YES
N	3715	3715	1212	1212	1212
Adj. R2	0.198	0.198	0.218	0.232	0.232

Note: Robust SEs in parentheses, $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. Socioeconomic controls incl. marital status, children in hh, age, education, retirement status, risk aversion, homeownership status, net income, East Germany and retirement status.

Similar result as specification based on "Big-3"

Balance: socioeconomic & demographic characteristics in follow-up

Balancing of covariates across control and treatment condition in follow-up
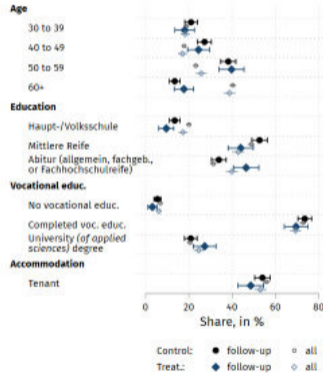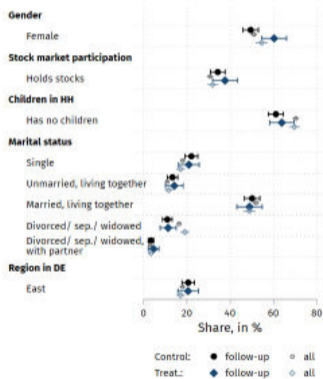
- Similar pattern as in first interview
- Without children, aged 40-59, not divorced and not with low secondary education more likely to be in follow-up
- no difference in attrition across treatment conditions

Note: Proportions of socioeconomic and demographic characteristics at time of first interview for respondents that also participated in follow-up interview in 2022/23. 282 of our 1212 treated respondents and 756 of 3715 respondents of our control condition responded.

Table: Comparison to other surveys on financial literacy in Germany - all respondents

	Compound Interest		Inflation		Risk diversification		"Big-3"	
	Correct	DNK	Correct	DNK	Correct	DNK	Correct	1+ DNK
EB 525* (23)	56.4	4.2	67.6	6.3	63.5	15.5	32.5	19.0
OECD-INFE* (22)	73.4	7.9	90.2	3.9	84.1	8.1	63.7	15.4
PHF (17)	83.2	1.8	86.3	3.4	70.7	12.9	60.5	13.8
PHF (21)	81.0	1.8	88.3	2.2	77.1	8.1	61.8	9.6
Control	49.5	8.1	75.0	9.9	56.5	29.8	30.7	34.9
Treated (raw)	54.6	—	82.5	—	82.8	—	42.8	—
Treated (adj.)**	50.9	9.5	75.2	10.6	75.6	9.3	38.0	17.2

Note: EB (Euro Flash Eurobarometer 525) and OECD-INFE questions are based on the OECD-framework. They differ from the exact questions we used in our survey, but deal with the same underlying financial concepts. **DNKs refer to "I did not know the answer, I guessed", which was asked in a follow-up question. All data weighted.

Table: Comparison to other surveys on financial literacy in Germany - women

	Compound Interest		Inflation		Risk diversification		"Big-3"	
	Correct	DNK	Correct	DNK	Correct	DNK	Correct	1+ DNK
EB 525* (23)	47.5	4.2	62.2	9.0	58.5	21.0	24.4	26.4
OECD-INFE* (22)	65.3	11.9	87.3	5.2	80.0	11.1	54.1	21.6
PHF (21)	76.4	2.3	86.0	3.0	73.3	10.9	54.8	13.5
Control	42.6	11.5	69.3	13.5	47.9	37.7	22.1	19.0
Treated (raw)	49.3	—	80.4	—	81.6	—	35.2	—
Treated (adj.)**	45.3	11.3	69.8	14.9	72.3	12.3	29.7	21.8

Note: EB (Euro Flash Eurobarometer 525) and OECD-INFE questions are based on the OECD-framework. They differ from the exact questions we used in our survey, but deal with the same underlying financial concepts. **DNKs refer to "I did not know the answer, I guessed", which was asked in a follow-up question. All data weighted.

Table: Comparison to other surveys on financial literacy in Germany - men

	Compound Interest		Inflation		Risk diversification		"Big-3"	
	Correct	DNK	Correct	DNK	Correct	DNK	Correct	1+ DNK
EB 525* (23)	65.6	5.8	73.2	3.5	68.3	58.5	41.0	11.3
OECD-INFE* (22)	81.4	3.9	93.1	2.5	87.3	5.2	73.3	9.2
PHF 2021	85.0	1.3	90.3	1.8	80.4	5.6	67.9	6.2
Control	56.7	4.6	81.0	6.3	65.4	21.7	39.6	8.7
Treated (raw)	60.8	—	84.9	—	84.1	—	51.7	—
Treated (adj.)**	57.5	7.3	81.5	5.6	79.3	5.9	47.6	11.8

Note: EB (Euro Flash Eurobarometer 525) and OECD-INFE questions are based on the OECD-framework. They differ from the exact questions we used in our survey, but deal with the same underlying financial concepts. **DNKs refer to "I did not know the answer, I guessed", which was asked in a follow-up question. All data weighted.

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