Item nonresponse and interviewer effects on asset questions in SHARE

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This paper deals with item nonresponse on asset questions in the German sub-sample of a cross-national face-to-face panel survey, the Survey of Health, Ageing and Retirement in Europe (SHARE). Besides gathering information about assets, SHARE is collecting micro data on health, socio-economic status and social and family networks. Thus, the questionnaire is divided into numerous CAPI modules. With an average item nonresponse rate of 6%, the assets module represents the highest share of item nonresponse of all questionnaire modules[1]. One reason for being vigilant with missing data lies in the convention of listwise deletion which could lead to biased results when data is not missing at random.

By linking respondent data to interviewer data, I am able to focus on features of the interviewers, as they play a crucial role in the data generating process. Furthermore, interviewers are rather under control of the researcher than the survey participant. My research aim is to find out if interviewers influence the nonresponse in asset questions and if so, do the interviewer expectations and their own hypothetical behavior play a crucial role in this context.

This paper starts with the theoretical background of the interviewer's influence on respondent behavior. The next section gives an overview of the data and sample composition. Section four concentrates on descriptive analyses whereas section five presents the results of multilevel analyses. The last part sums up and discusses my findings.

1. Theoretical background

Groves and Couper's (1989: 30) conceptual framework of survey participation states that, besides the social environment, the survey design and the respondent him or herself, the interviewer and his or her interaction with the respondent play a crucial role in persuading people to participate. I assume the same for answering a set of questions, "[…] as once respondents agreed to participate in a certain survey, they still have the opportunity to decline answer specific questions"

[1] The average item nonresponse rate of the asset questions is 6%. That means that on average the respondent does not answer one question of the given 22 asset questions. For more details about the asset module please see table 1 in appendix pp.8-10.

(Tourangeau and Yan 2007: 862). The decision if information is reported is driven by the same factors as the decision to cooperate in a survey.

The interviewers' experience, attitudes, expectations and own behavior vary. Therefore they act and behave differentially while collecting data (cf. Blom and Korbmacher 2013: 5). I focus on two aspects: interviewers' own hypothetical behavior and interviewers' expectations.

Kant stated in the late 18th century that you should act in such a way that you can will that your act should be a universal law[2]. This law, reflecting one's own hypothetical behavior, is very well known and incorporated in the cultures of many societies all over the world. Transferred into the world of survey requests it means that questions which would not be answered by the interviewers themselves are hard to sell to respondents well. The way interviewers would perform if challenged with the same situation as the respondent and, therefore the interviewers' hypothetical own behavior, guides the way they interact in the interview. For example, an interviewer who would not report asset values in a given survey may not try hard to persuade the respondent to give an answer while asking about assets. Literature on the association of the interviewer and Kant's law is rare. Pickery and Loosveldt (2001) found out that interviewers' item nonresponse on questions also asked to survey respondents accounted most for explaining differences in the respondents' item nonresponse.

With regard to the interviewers' expectations I rely on the Thomas theorem which tells us: "If men define situations as real, they are real in their consequences" (Thomas 1928: 572), and it is known in the literature as the self-fulfilling prophecy. Therefore once meanings are assigned to a situation, the consequences are determined by the ascribed meaning, although they must not apply. Prophecies and predictions become part of the situations and affect the development of the situation. They evoke a behavior which makes the consequences of the predicted outcome real. In the current case it means that interviewers who expect that their respondents will report their assets define the situation as real. As a consequence, this expectation affects the respondents in a way, so that they really provide information about their assets. A wide range of literature can be found which supports the self-fulfilling prophecy hypothesis. However, little research has been done on the interviewers' expectations and their impacts on survey outcomes. Nevertheless, Korbmacher 2014 and Sakshaug et al. 2013 state a positive effect. Concerning item nonresponse rates, no research exists so far.

[2] „Handle nur nach derjenigen Maxime, durch die du zugleich wollen kannst, dass sie ein allgemeines Gesetz werde" (Kant 1785: 421)

2. Data and methods

In the following, the data of SHARE's fifth wave is used (cf. Börsch-Supan 2015). In the year 2013, 5758 people aged 50 or older and their partners (regardless of age) participated in the German sub-sample of wave 5 of the European SHARE survey (for more detailed information on SHARE, see Börsch-Supan et al. 2013, 2015).

Some modules in the SHARE questionnaire are only asked by a predefined role type of the respondents' household. In the case of the asset module, only the financial respondent is answering these questions. This results in a first reduction to 3832 respondents. Furthermore, it is possible that questions modules can be answered by a proxy[3]. When a proxy has been involved in the asset section I excluded these interviews for the later analyses, remaining with 3701 participants. The underlying mechanism for refusing or not knowing the answer when assisted by proxy might be different from an independent self-reporting respondent.

I use detailed information about the interviewers coming from the SHARE's Interviewer Survey (cf. Blom and Korbmacher 2013). Due to unit nonresponse in the Interviewer Survey or item nonresponse on the interviewer ID, approximately 600 respondent interviews could not be linked to any Interviewer Survey data. Finally, 2573 respondents and 142 interviewers could be analyzed. Detailed information of the sample composition can be found in the appendix (cf. Table 2, p.11).

The selection of all variables is mainly based on prior research (Sudman and Bradburn 1974, Singer et al. 1983, Berk and Bernstein 1988, Groves 1989, Hox et al. 1991, Loosveldt 1998, Pickery and Loosveldt 2001). The interviewers' own hypothetical behavior is measured by the question "How likely is it that you would consent to linking your answers with the income tax assessment"; The interviewers' expectations are measured by the item "Social surveys very often ask about respondents' income. What do you expect, how many of your respondents (in percentage) in SHARE will provide information about their income?".

In the following, descriptive analyses illustrate the interviewers' characteristics and the response behavior of their respondents. Subsequently, a linear multilevel approach is used to answer the research questions.

[3] "If physical and/or cognitive limitations make it too difficult for a respondent to complete the interview her-/himself it is possible that the sample respondent is assisted by a so-called proxy respondent to complete the interview ("partly proxy" interview). If the proxy respondent answers the entire questionnaire in lieu of the respondent, the interview is referred to as a "fully proxy" interview. Examples of conditions under which proxy interviewing is allowed are hearing loss, speaking problems, Alzheimer´s disease and difficulties in concentrating for the whole interview time period" (SHARE Release Guide 5.0.0 2016: 17).

3. Descriptive analyses

In the following, the item nonresponse rate is defined by the sum of don't knows and refusals a respondent gave divided by the number of questions he or she received. Therefore the rate could range between zero and one, with zero meaning that all questions have a valid answer. If the interviewers' item nonresponse rate of his or her respondents were random there should be no problem at all. However, if there are some interviewers who are systematically collecting data with high item nonresponse rates due to specific characteristics this could end up in a bias. E.g., sample selection bias if using listwise deletion.

The distribution of the item nonresponse rate by interviewer shows, that there is some variation. Their item nonresponse rates of the asset questions ranges from 0 up to 34 percent (see Figure 1). That means that there are interviewers who can collect all required information from all their respondents up to interviewers who cannot collect one third on average of the required information.

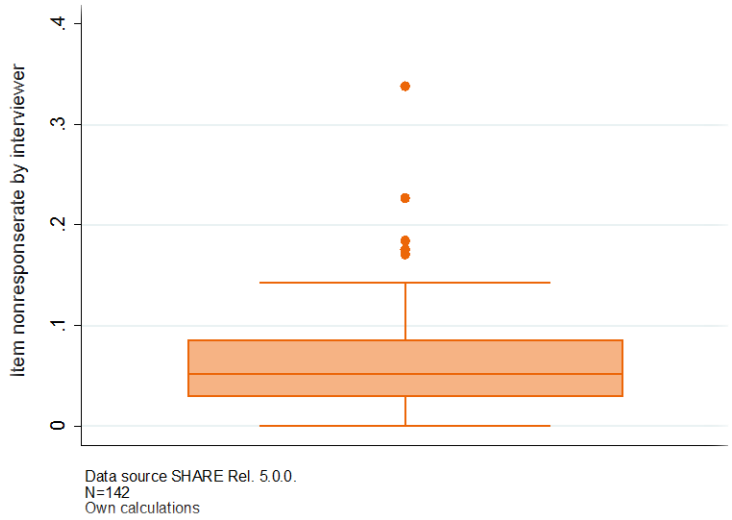


Figure 1 Distribution of item nonresponse rate on asset questions by interviewer.

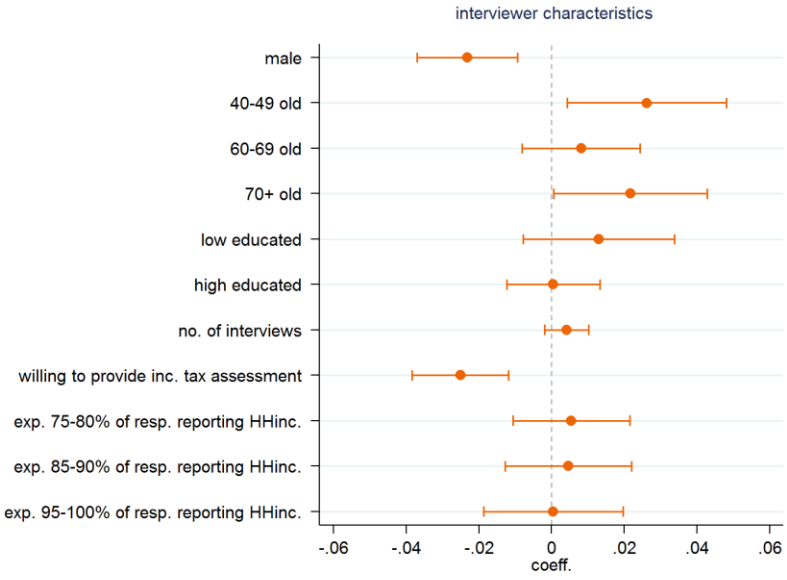
Descriptive figures of the item nonresponse rate by interviewer in dependence of the variables if interviewers were willing to link their own survey data with the income tax assessment and therefore would provide that information, as well as in dependence of their expectations about the share of reported income of their respondents are shown in the appendix p. 10 (see Figure 3 and 4). Kant's concept seems to evoke more variation within the interviewers than the self-fulfilling prophecy. The following linear multilevel analyses demonstrate weather the variation in the item nonresponse rate by interviewer (see Figure 1) can be explained by these theoretical concepts.

4. Multilevel analyses

Respondents are nested within interviewers. This hierarchical structure makes it necessary to use an appropriate analysis method, which allows separating the effects precisely between respondents and interviewers. Therefore, I use a multilevel approach by setting the respondents to the first level and interviewers to the second level.

First of all, I want to confirm the assumption that the item nonresponse rate of the asset module is dependent on the interviewer. Using the intraclasscorrelation coefficient (ICC) from the intercept-only model (cf. Model 0, Appendix p. 13), it shows that these 142 interviewers differ in obtaining item nonresponse in asset questions of their respondents. The share of the total variance which can be set to the interviewer is 20.8%. Therefore it is dependent from the interviewer how many questions will be answered with 'don't know' and/or 'refusal'.

Figure 2 represents the full random-intercept-model (cf. Model 2, Appendix pp. 12-13) which includes variables on both levels. However, only the effects of the interviewer characteristics, based on a confidence level of 95%, are illustrated and discussed.



Data source SHARE Rel. 5.0.0.
N(Interviewers) =142, n(Respondents) =2573;
Own calculations;
Ref. categories: female, 50-59 old, middle educated, less/not willing to provide inc. tax assessment ,exp. 25-70% of resp. reporting HHinc.

Figure 2 Excerpt of the full random-intercept-model: interviewer characteristics.

The graphic shows that besides the interviewers' gender and age, their hypothetical willingness to link and provide own income tax assessment lowers the item nonresponse rate of his or her respondents significantly by 3 percentage points. This result supports the hypothesized influence of Kant's posted social law. Being challenged with the same situation as the respondent, it influences the way of interaction. Transferring this effect to the asset question module, it turns out that under the ceteris paribus assumption the mean of the respondents' item nonresponses rate could almost be divided in half when all interviewers

would be willing to provide their income tax assessment via linkage. With respect to the self-fulfilling prophecy, there are no significant differences. Therefore the hypothesis that the interviewers' expectations affect the respondents in their way of reporting assets has to be rejected. There are no remarkable differences of interviewers in the last three quartiles of expected share of respondents reporting their household income compared to the first quartile.

Considering the ICC in the full model it gets clear that the share of unexplained variance of the respondents' item nonresponse rate which could be set to the interviewer decreases from 20.8 % to 14.6%.

5. Summary and discussion

The goal of this paper was to examine whether interviewers have an effect on respondents' decision to answer asset questions and whether the interviewer effects can be explained by characteristics of the interviewer. The outcome of interest was the item nonresponse rate on asset questions in the fifth SHARE wave in Germany. I used a multilevel approach to differentiate effects of the respondent from the interviewer precisely. Interviewers' expectations and their own hypothetical behavior of reporting income were highlighted because self-fulfilling prophecy and own reporting behavior potentially influence the outcome. There are four main findings: First, interviewers have a large effect on respondents' item nonresponse rate, as the ICC of 21% in the random-intercept-only model shows. Second, the information coming from the Interviewer Survey is useful in explaining the interviewer effects. The interviewer variance in the full model was decreased by 6%. Third, interviewer's hypothetical behavior has an impact on the item nonresponse rate of their respondents. Fourth, expectations regarding their interviewing success show no significant effect on the item nonresponse rate of their respondents.

A limitation of this study might be that the variables themselves which have been used for theoretical modelling could be criticized. Neither the household income is asked in the asset module nor are tax questions included. However, the chosen variables represent the overall idea of reporting any private asset values. Furthermore, the variables based on interviewers are only measured at one point in time - before fieldwork. Hence, it could be the case that interviewers change their expectations during fieldwork and adapt their behavior. Moreover, future studies should use further information of the Interviewer Survey, as there is still some variation left which could be explained by interviewer characteristics.

Appendix

Table 1 Asset questions and percentage of item nonresponse

Variable	Label	Question	n	DKs&RFs
as003e	Amount bank account	About how much do you* currently have in bank accounts, transaction accounts, saving accounts or postal accounts?	2514	28,7%
as007e	Amount in bonds	About how much do you* currently have in government or corporate bonds?	240	32,5%
as011e	Amount in stocks	About how much do you* currently have in stocks or shares (listed or unlisted on stock market)?	279	25,81%
as017e	Amount in mutual funds	About how much do you* currently have in mutual funds or managed investment accounts?	395	24,6%
as019_	Mutual funds mostly stocks or bonds	Are these mutual funds and managed investment accounts mostly stocks or mostly bonds?	395	12,4%
as020_	Who has individual retirement accounts	Who has individual retirement accounts?	524	0,2%
as021e	Amount individual retirement accounts	How much do you currently have in individual retirement accounts?	529	44,2%
as023_	Individual retirement accounts mostly in stocks or bonds	Are these individual retirement accounts mostly in stock s or mostly in bonds?	527	31,5%
as024e	Partner amount individual retirement accounts	How much does your husband/wife/partner currently have in individual retirement accounts?	415	52,5%
as026_	Partner individual retirement accounts mostly in stocks or bonds	Are these individual retirement accounts mostly in stock s or mostly in bonds?	415	35,7%
as027e	Amount contractual saving for housing	About how much do you* currently have in contractual saving for housing?	542	20,9%
as029_	Life insurance policies term or whole life	Are your life insurance policies term policies, whole life policies, or both of these?	523	1,3%
as030e	Face value of whole life policies	What is the face value of the whole life policies owned by you*?	667	30,1%
as041_	Own firm company business	Do you* currently own a firm, company, or business?	2573	0,5%
as042e	Amount selling firm	If you sold this firm, company or business and then paid off any debts on it, about how much money would be left?	195	41,5%
as044_	Percentage share firm owned	What percentage or share of this firm, company or business is	195	2,1%

		owned by you*?		
as049_	Number of cars	How many cars do you* own? Please exclude company cars.	2573	0,2%
as051e	Amount selling cars	If you sold this/these car/cars about how much would you get?	2099	4,7%
as054d1	Owe money: debt on cars and other vehicles (vans/motorcycles/boats, etc.)	The next question refers to money that you owe, excluding mortgages (if any). Looking at showcard, which of these types of debts do you* currently have, if any?	2573	0,3%
as054d2	Owe money: debt on credit cards/store cards	Looking at showcard, which of these types of debts do you* currently have, if any?	2573	0,3%
as054d3	Owe money: loans (from bank, building society, other financial institution)	Looking at showcard, which of these types of debts do you* currently have, if any?	2573	0,3%
as054d4	Owe money: debts to relatives or friends	Looking at showcard, which of these types of debts do you* currently have, if any?	2573	0,3%
as054d5	Owe money: student loans	Looking at showcard, which of these types of debts do you* currently have, if any?	2573	0,3%
as054d6	Owe money: overdue bills (phone, electricity, heating, rent)	Looking at showcard, which of these types of debts do you* currently have, if any?	2573	0,3%
as054dno	Owe money: none of these	Looking at showcard, which of these types of debts do you* currently have, if any?	2573	0,3%
as054dot	Owe money: other	Looking at showcard, which of these types of debts do you* currently have, if any?	2573	0,3%
as055e	Amount owing money in total	Not including mortgages or money owed on land, property or firms, how much do you* owe in total?	461	12,8%
as060_	Has bank account	Do you* currently have at least a bank account, or transaction account, or saving account or postal account?	2573	0,9%

as061_	Reason for not having a bank account	Please look at showcard. Look ing at this list, please tell me which is the most important reason you* currently do not have bank accounts, transaction accounts, saving accounts or postal accounts? 1. Do not like dealing with banks 2. Minimum balance/service charges are too high 3. No bank has convenient hours or location 4. Do not need/want a bank account 5. Do not have enough money 6. Savings are managed by children or other relatives (in or outside the household) 95. Actually I/we do have an account 97. Some other reason	27	0%
as062_	Has bonds	Do you* currently have any money in government or corporate bonds?	2573	2,2%
as063_	Has stocks	Do you* currently have any money in stock s or shares (listed or unlisted on stock mark et)?	2573	1,8%
as064_	Has mutual funds	Do you* currently have any money in mutual funds or managed investment accounts?	2573	1,7%
as065_	Has individual retirement accounts	Do you* currently have any money in individual retirements accounts?	2573	12%
as066_	Has contractual saving	Do you* currently have any money in contractual saving for housing?	2573	1,7%
as067_	Has life insurance	Do you* currently own any life insurance policies?	2573	1,5%
as070e	Interest or dividend income	Overall, about how much interest or dividend income did you* receive from your savings in bank accounts, bonds, stock s or mutual funds in 2012? Please give me the amount after taxes	2514	36,2%

Note: *"You" refers to respondent and/or spouse/partner.
Due to filters/routing not all questions are answered by all respondents; Number of respondents for each question can be found in the column "n". The column "item nonresponse" represents share of "n"'s who answered "don't know" and/or "refusal".
Data source: SHARE Rel.5.0; own calculations.

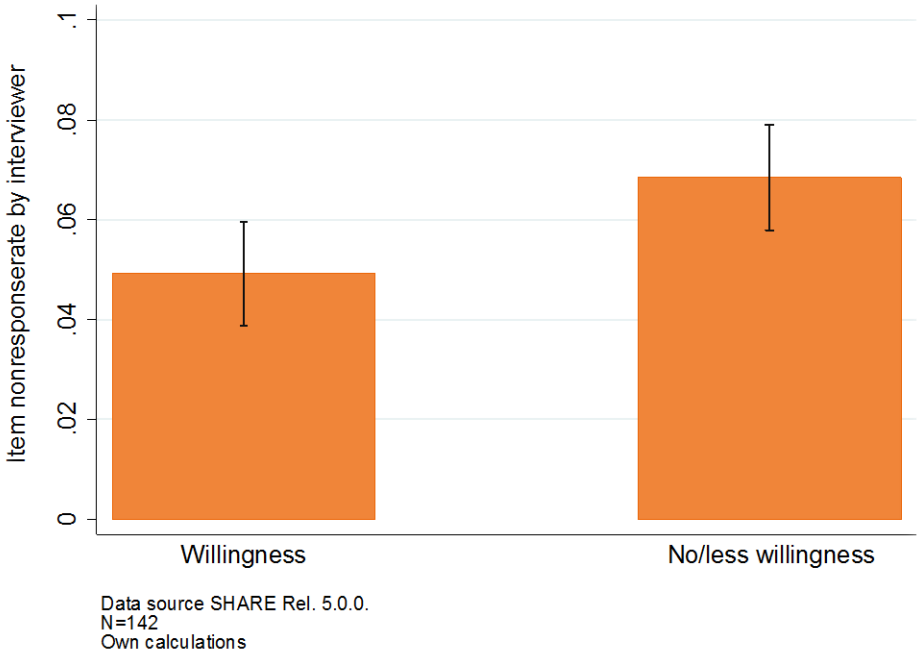


Figure 3 Differences of item nonresponse rate by interviewers' willingness to provide tax income assessment.

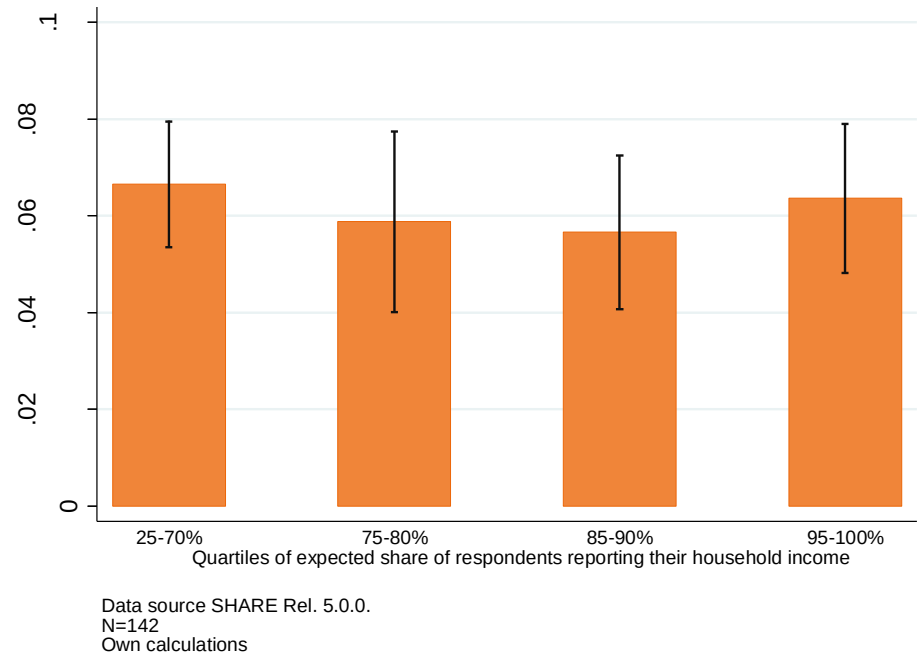


Figure 4 Differences of item nonresponse rate by interviewers' expectations about respondents' share of reporting household income.

Table 2 Sample composition

Respondents	N=3067	N=2573
Gender		
Male	48,9	48,1
Female	51,1	51,9
Age		
> 65	56,2	55,6
65-69	12,6	12,2
70-79	22,7	23,8
> 80	8,5	8,4
Level of education		
low	11,78	12,0
middle	56,6	57,5
high	31,27	30,4
Refusal / don't know	0,3	0,1
Household income	Mean=5898,2	Mean=5968,6
Income missing	23,4	16
Working status		
retired	49,3	50,3
paid work	36,9	35,6
other	13,8	14,2
Health status		
poor	8,6	8,9
fair	30,3	30,4
good or better	61,1	60,7
Verbal memory score		
First quartile	31,1	31,1
Second quartile	22,3	22,3
Third quartile	23,5	23,2
Fourth quartile	23,0	23,5
Math skills at age 10: relative position to others		
Much better/better	33,2	33,1
Ref. About the same	54,6	54,8
Worse/much worse	11,5	11,5
No information	0,6	0,6
Financial literacy index		
Ref. 1 (worse)	2,4	2,1
2	9,4	9,2
3	20,5	21,1
4	32,6	32,9
5 (very good)	14,5	14,2
No information	20,5	20,4
Trust		
in other People -10 point scale	Mean = 5,3	Mean = 5,3
Type of respondent		
Panel	79,4	79,6
Refresher	20,6	20,4

Table 3 Linear multilevel estimation: Item nonresponse rate of asset module

	Model 0	Model 1	Model 2
Respondent			
Gender			
Male		-0.01**	-0.01**
Ref. female			
Age			
> 65		0.01	0.01
Ref. 65-69			
70-79		0.01*	0.01*
≥ 80		0.01	0.01
Level of education			
low		-0.00	-0.00
Ref. middle			
high		0.00	0.00
Refusal / don't know		-0.02	-0.02
Household income			
First quartile		-0.01	-0.01
Ref. Second quartile			
Third quartile		0.00	0.00
Fourth quartile		0.00	0.00
Income missing		0.09***	0.09***
Working status			
retired		-0.01	-0.01
Ref. paid work			
other		-0.00	-0.00
Health status			
poor		-0.01	-0.00
Ref. fair			
good or better		0.00	0.00
Verbal memory score			
First quartile		0.00	0.00
Ref. Second quartile			
Third quartile		0.01	0.01
Fourth quartile		0.00	0.00
Math skills at age 10: relative position to others			
Much better/better		-0.01	-0.01
Ref. About the same			
Worse/much worse		0.00	0.00
No information		-0.01	-0.01
Financial literacy index			
Ref. 1 (worse)			
2		0.02	0.02
3		0.02	0.02
4		0.02	0.02
5 (very good)		0.02	0.02
No information		0.07	0.07
Trust			
in other People -10 point scale; z-standardized		0.00	0.00
Type of respondent			
Panel		-0.06	-0.06
Ref. Refresher			
Urbanization			
big city		0.00	0.01
Ref. suburbs or outskirts of a big city			
large town		-0.01	-0.01
small town		-0.01	-0.01
rural area or village		0.00	0.00

Federal state			
Ref. Baden-Württemberg			
Bavaria		-0.01	-0.01
Berlin		0.00	0.02
Brandenburg		-0.03	-0.01
Bremen		-0.03	-0.00
Hamburg		-0.03	-0.03
Hesse		-0.01	-0.02
Mecklenburg-Western Pomerania		-0.03	-0.02
Lower Saxony		-0.01	-0.01
North Rhine-Westphalia		-0.03*	-0.03*
Rhineland-Palatinate		-0.04*	-0.05*
Saarland		-0.04	0.00
Saxony		-0.02	-0.02
Saxony-Anhalt		-0.01	-0.03
Schleswig-Holstein		-0.01	-0.01
Thuringia		-0.01	-0.02
Household composition			
single HH		-0.02***	-0.02***
Ref. HH with 2 partners			
HH with more than 2 persons		-0.00	-0.00
Presence of other persons			
Yes		0.01***	0.01***
Ref. No			
Length of Module as in Minutes			
First quartile		-0.00	-0.00
Ref. Second quartile			
Third quartile		0.01*	0.01*
Fourth quartile		0.03***	0.03***
Willingness to cooperate			
Good-High		-0.04***	-0.04***
Ref. Fair-bad			
Interviewer			
Gender			
Male			-0.02**
Ref. female			
Age			
40-49			0.03*
Ref. 50-59			
60-69			0.01
70-79			0.02*
Level of education			
low			0.01
Ref. middle			
high			0.00
Number of interviews; z-standardized			0.00
Linkage tax assessment within a survey			
Willingness to provide income tax assessment			-0.03***
Ref. no/less willingness			
Share of expected respondents reporting household income			
Ref. Frist quartile (25-70%)			
Second Quartile (75-80%)			0.01
Third. Quartile (85-90%)			0.01
Fourth Quartile (95-100%)			0.00
ICC	0.208	0.182	0.146
χ 2 against linear regression	335.99***	232.24***	180.82***
χ 2 against previous model	-	755.01***	25.75**
N(Respondents)	2573	2573	2573
N(Interviewers)	142	142	142

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Data Source: SHARE Rel.5.0.0; own calculations.

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