# Pension Reform Preferences in Germany: Does Information Matter?\*

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#### Abstract

Demographic change has an impact on pay-as-you-go pension systems. To maintain their financial sustainability, reforms are necessary but often lack public support. Based on representative survey data from Germany, we conduct an information provision experiment that deals with the topic of demographic change. With this, we investigate whether salience of or information about demographic change enhances preferences towards reforms in general as well as towards specific reform measures which enhance financial sustainability. We find that information provision as well as salience significantly increases the perceived reform necessity. Furthermore, salience of the topic increases the likelihood that respondents prefer increasing the retirement age over other reform measures. In addition, we highlight the impact of prior beliefs and find that the effect of information provision is more positive for respondents with lower beliefs.

JEL classification: H55, J26, C90

*Keywords*: pension reform preference, survey experiment, demographic change, information provision, belief updating

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#### 1 Introduction

According to the OECD (2019), most western societies are characterized by low fertility rates, while life expectancy has been steadily increasing. The resulting ageing of the population might cause severe problems for the financial sustainability of pension systems, especially when they are organized as pay-as-you-go systems and strongly rely on intergenerational redistribution. To deal with this challenge, pension systems have to adapt, which makes reforms of old-age security a widely and often controversially discussed topic. Our paper analyzes a survey experiment to address the questions whether salience about the challenges, which the pension system faces, and information about demographic change have an impact on respondents' preferences towards pension reforms in general and towards more specific reform measures. We will focus on Germany since demographic change is a huge challenge for the German statutory pension insurance leading to a large need for reforms (Börsch-Supan et al. 2020).

The German pension system consists of three pillars, which are the public, the private and the occupational pillar. Similar to other (western) countries, the statutory pension insurance, which is part of the public pillar, is organized as a pay-as-you-go system, implying that the contributions of the current working generation are used to pay the pension benefits of the current retired generation. Against the background of the demographic change, the necessity of reforms to enhance the financial sustainability for the next decades is part of a larger public debate in Germany. Several reforms of the pension system were implemented during the last decades to deal with the challenges that are linked to demographic change. More recent reforms include an increase in the retirement age from 65 to 67. A further reform limited the increase in the contribution rate to a maximum of 20% until 2025 while keeping the pension level at 48% or above. While economic experts often suggest to further increase the retirement age or to put more emphasis on private pensions, several changes were implemented that had opposing effects and increased the pension payments like e.g., the so called "Mütterrente", which allocated extra pension points to some mothers, the German basic pension for those with small pension claims or the reduction of the retirement age to 63 for those with a working history of 45 years (Board of Academic Advisors at the Federal Ministry for Economic Affairs and Climate Action 2021).

Recent studies about the German pension system focus on four reform measures to take the demographic change into account and to improve the sustainability of the German statutory pension insurance: increasing the retirement age, decreasing the pension level, increasing the contribution rate or increasing tax subsidies (Deutsche Bundesbank 2019; German Council of Economic Experts 2020). Although pension reforms are necessary, the acceptance of pension reforms is rather small (Fornero and Lo Prete 2019). Therefore, it is important to understand whether salience<sup>1</sup> of or information about these challenges decrease the opposition towards general or specific reform measures. This is the aim of this paper. Specifically, we implement a survey experiment capturing both, salience and information provision, and ask respondents about their preferences towards pension reforms regarding the German pension system in general as well as towards the four specific reform measures mentioned above. This allows us to disentangle,

<sup>&</sup>lt;sup>1</sup>Salience means that we make respondents aware of demographic change.

whether the reform preferences change due to the information provision on the demographic change or due to the salience with this topic.

The existing literature mostly focuses on effects of information provision on pension provision behavior, but also on financially literacy and on reform preferences. Research focusing on pension provision behavior finds that information on pension benefits and expected pension payments has a positive effect on labor supply and retirement savings in Germany (Dolls et al. 2018), while in the United States (US) receivers who are more aware of their expected benefits do not change their retirement behavior (Mastrobuoni 2011). Related to financial literacy, when showing female survey respondents three short video tutorials, Angelici et al. (2022) find that the treated individuals are more interested in learning more about the pension system. A simplification of the choice of participating in a retirement savings plan in the US, however, does not lead to an increase in retirement savings plan participation (Beshears et al. 2013). Evidence on the effects of peer information is mixed, since Duflo and Saez (2003) find positive effects on pension plan enrolment while Beshears et al. (2015) find negative effects on savings.

Some recent studies focusing on financial literacy and pension reforms use survey experiments to analyze the effect of information provision on understanding the pension system and on reform preferences. They find that information on changes in the pension system makes respondents think that the pension system is easier to understand after the reform (Finseraas and Jakobsson 2014a). It also increases their actual understanding of the new pension system, but does not have an impact on their pension provision behavior (Finseraas and Jakobsson 2014b). Furthermore, Finseraas et al. (2017) study the effect of information campaigns on short- and medium-term knowledge. They find that the effect of providing information does not persist four months after the intervention and therefore, they conclude that information only has a limited effect on increasing public knowledge about reforms. According to Fornero and Lo Prete (2019), a higher level of economic and financial knowledge also reduces the electoral costs of enforcing reforms of the pension system. This finding is in line with Boeri and Tabellini (2012) who find that more informed individuals also have a higher acceptance of pension reforms.

Another recent study using a survey experiment is Naumann (2017), who evaluates the impact of reform pressure on welfare state support from a political science perspective. This study is the one closest to ours. For his analysis he conducts an information provision experiment. By clearly stating within the experiment that the demographic change is a risk for the financing of the statutory pension insurance, he wants to increase the perceived reform pressure due to demographic change. Following this experiment survey respondents are asked about their most and least preferred reform proposal. He finds that treated individuals are less likely to oppose an increase of the retirement age.

To address our research questions, whether salience and information about demographic change have an impact on pension reform preferences, we conduct a computer assisted telephone interview (CATI) study with a sample of 1000 respondents in Germany. The main feature of our survey is an information provision experiment which asks respondents about their beliefs about the demographic change in Germany within the next 30 years. This information provision experiment allows us to draw conclusions on the causal effect of information and salience on reform preferences.

Our experiment differs from the one conducted by Naumann (2017) in two ways: First, we do not only inform respondents about the importance of demographic change, but also ask them about their prior beliefs, i.e. how they think the old-age to working-age ratio will develop. This allows us to analyze heterogeneous treatment effects based on prior beliefs. Second, other than Naumann we ask respondents about their preferred option for each of six pairwise policy trade-offs derived from the four options increasing the retirement age, decreasing the pension level, increasing contribution payments and increasing tax subsidies. This allows us to analyze in a more detailed way the individual rankings of policy measures and how preferences are affected by the treatment.

We find that information provision on demographic change has significant effects on perceived reform necessity and the preference towards reform measures that positively affect the financial sustainability of the statutory pension insurance. When analyzing the treatment effects dependent on respondents' prior beliefs about the demographic change, we find that a higher mean of prior beliefs leads to a lower perceived reform necessity.

The remainder of the paper is organized as follows: Section 2 presents our experimental design as well our hypotheses and our data basis and section 3 introduces our method. In section 4 the results for perceived reform necessity and the impact of the information provision experiment on preferences towards specific reform measures are discussed. Finally, section 5 concludes.

# 2 Design and Hypotheses

### 2.1 Sample

For our analysis, we use a sample of 1000 German inhabitants of working age. We oversample respondents from East Germany and end up with 400 respondents form the Eastern part and 600 respondents from the Western part of Germany. Around half of the respondents are female and nearly half of them are aged 50 and above. Furthermore, one third graduated from university. The majority of the respondents is currently employed and half of the respondents are married. Additionally, two thirds of the respondents have children and the average household size is 2.55. Every seventh respondent has a migration background. Appendix B provides descriptions of all variables and Appendix C shows descriptive statistics.

Our sample was collected by computer assisted telephone interviews (CATI). These telephone interviews were conducted by a professional survey company between November 2020 and May 2021 using the dual frame approach.<sup>2</sup> Our sample is representative for East and West Germany, respectively, with respect to age, gender and state of residence. With regard to education our sample is more highly educated than the average population. Additionally, the share of respondents with a migration background equals the share in the East German population but is lower than the share for West Germany.

 $<sup>^{2}\</sup>mathrm{The}$  dual frame approach implies that both, landlines and mobile numbers were called.

### 2.2 Experimental Design and Balance

Respondents are randomly selected into one of three groups, which vary with regard to the information provided. As shown in Figure 1 the control group (C) is not asked about demographic change before answering the questions about their reform preferences and is therefore not actively confronted with the topic of demographic change until a later point in the survey  $^3$ . The two treatment groups, on the other hand, are asked about their beliefs about demographic change. More precisely, the information provision experiment introduces the fact that the German pension system is organized as a pay-as-you-go system and that it is therefore necessary to look at the ratio between people of retirement age and people of working age to assess its financial sustainability. Before eliciting respondents' beliefs we inform them that in the year 1990 there were 24 people of retirement age for every 100 people of working age. We then ask about their beliefs on this ratio for the years 2020 and 2050 in order to be able to evaluate how they view demographic change.<sup>4</sup> Treatment group 1 (T1) does not receive any information about the correct ratios. This allows us to identify the role of salience in the framework of the experiment. Treatment group 2 (T2), on the contrary, is additionally provided with the correct ratios combined with an evaluation of the individual beliefs, i.e. whether they were too high, too low or quite accurate. For 2020 the correct value is 37. Respondents receive the feedback that their estimate was quite accurate when it was between 33 and 41. The correct value for 2050 is 55. Correspondingly, respondents receive the feedback that their estimate was quite accurate when they estimate a value between 51 and 59. We assume that by informing respondents about the correct ratios they update their beliefs and therefore form posterior beliefs that are close to the correct values. Furthermore, we assume that, due to the information they received, this updating results in a shift of their reform preferences. Figure 2 shows the prior beliefs of respondents in all groups on the left-hand side and the posterior beliefs of treatment group 2 on the right-hand side. It can be seen that the majority of respondents in treatment group 2, who receive information of the correct ratios, indeed updates their beliefs.

To see whether randomization to one of the three experimental groups was successful we conduct balance tests (see Table A.2 for the full sample and Tables A.3 and A.4 for the East and West German subsamples). As the three groups are well balanced regarding the most important characteristics, this allows us to interpret our results causally.

#### 2.3 Hypotheses

When comparing the control group C with treatment group T1 we hypothesize that creating salience about demographic change leads to a larger preference for reforms in general as well as to a larger preference for specific reform measures that positively affect the financial sustainability of the statutory pension insurance. We expect this effect to be larger for higher prior beliefs, since respondents with a higher estimate of demographic change are expected to view the situation as more severe and are therefore maybe also more likely to have a stronger reform preference.

<sup>&</sup>lt;sup>3</sup>The control group is asked about their prior beliefs near the end of the survey.

<sup>&</sup>lt;sup>4</sup>The exact wording of the experiment is provided in Appendix A.



Figure 1: Set-up of the information provision experiment

With respect to treatment group T2, we hypothesize that the effect of providing the correct information depends on the prior beliefs about demographic change, i.e. whether respondents overestimated or underestimate the change. In case of underestimation, we expect an increase in the preferences for reforms in general as well as for reform measures that support the financial sustainability of the statutory pension insurance. Respondents are then informed about the fact that the aging of the German population is faster than they estimated. Following an analogously line of reasoning, in the case of overestimation we expect that the correct information reduces the preference for reforms in general as well as for specific reform measures targeted at the financial sustainability. Respondents are informed that the situation is less severe. Therefore, reforms might no longer seem so necessary to them. With the chosen experimental design, we are thus able to address the question of salience versus information provision and highlight any changes caused by differences in prior beliefs.

#### 3 Method

For estimating the causal effect of our information provision experiment, we use equation (1)

$$y_i = \gamma_0 + \gamma_1 T \mathbf{1}_i + \gamma_2 T \mathbf{2}_i + \varepsilon_i \tag{1}$$

$$y_i = \gamma_0 + \gamma_1 T \mathbf{1}_i + \gamma_2 T \mathbf{2}_i + \gamma_3 T \mathbf{1}_i \times P_i + \gamma_4 T \mathbf{2}_i \times P_i + \gamma_5 P_i + \gamma^T X_i + \varepsilon_i$$
(2)

where  $y_i$  denotes our outcome variables indicating different reform preferences. T1 and T2 denote the treatment indicators for both treatment arms, which are dummy variables that are equal to 1 if a respondent is part of the respective treatment group.  $\varepsilon_i$  denotes the error term. Since our sample is well balanced over the three treatment groups we do not need to include control variables. To see the sensitivity of our result, however, we show results with and without control variables. The variable  $X_i$  therefore indicates the vector of control variables. Furthermore, P





Notes: The figure shows on the left hand side the prior beliefs of all respondents for the year 2020 (top) and 2050 (bottom). On the right hand side the posterior beliefs of treatment group T2, i.e. those who receive the correct information, are displayed. The red line indicates the correct value, i.e. 37 for the year 2020 and 55 for the year 2050. The figure only shows estimates between 0 and 150. There are however 98 respondents who estimate that either the ratio for 2020 or the ratio for 2050 or both is above 150.

denotes the standardized mean of prior beliefs.

When including control variables, we control for age, gender, socialisation in East Germany, migration background, education, children, employment status, trust in public institutions, time preference, equality views, optimism towards life in old-age, interest in old-age provision, occupation with the own expected old-age income, payment of contributions to the statutory pension insurance and the standardized mean of prior beliefs.<sup>5</sup>

In order to receive more precise estimates of the treatment effect we account for outliers for all analysis. Therefore, we exclude all respondents whose estimate of either one or both prior beliefs is above the 95th percentile or below the 5th percentile. This reduces our sample to 881 observations. Furthermore, we restrict our sample to contain only respondents for whom we have complete information regarding the control variables. This further reduces our sample to 856 respondents for the full sample. We do the same for the subsamples of East and West Germany and end up with 338 and 518 respondents respectively.

<sup>&</sup>lt;sup>5</sup>The full questions are shown in Appendix B.

#### 4 Results

#### 4.1 Necessity of Reforms

First, we evaluate the effect of our treatment on respondents' preference for reforms of the German pension system. Respondents state their perceived necessity for reforms on a 7 point Likert scale where 1 stands for "no reforms necessary" and 7 stands for "comprehensive reforms necessary".<sup>6</sup> We standardize the outcome variable using the mean and standard deviation of the control group. The results for the standardized outcome variable are presented in Table 1. In the table Panel A shows the results for the full sample and Panel B and C show the effects for the East and West German subsamples. To account for outliers in the prior beliefs we exclude observations with prior beliefs above the 95th percentile and below the 5th percentile. While columns (1) and (2) show the effects without interactions, columns (3) and (4) show the treatment effect interacted with the standardized mean of the prior beliefs for 2020 and 2050. The results indicate that treatment T2 has a positive and significant effect on the full sample of 22.5% of a standard deviation when including control variables (Panel A, column 2). When interacting the treatment variable with the prior beliefs we find that an increase in the mean of prior beliefs of one standard deviation significantly decreases the effect of information on demographic change (T2) by 19.5% of a standard deviation when including control variables (Panel A, column 4). Regarding the salience treatment we find that salience about the topic leads to a significant increase in the perceived reform necessity of 17.8% of a standard deviation, while there is no significant effect for the interaction of the treatment with the mean of prior beliefs. These findings are in line with our hypotheses.

When looking at the East German respondents we do not find a significant effect of the salience treatment (T1). However, we do find that the information treatment (T2) significantly increases the perceived reform necessity by 26.6% of a standard deviation when including controls (Panel B, column 2), while we do not find significant effects for the interaction. For the West German respondents on the other hand we find that both, the salience (T1) and the information treatment (T2) significantly increase the perceived reform necessity by 22.9% of a standard deviation when including controls (Panel C, column 2). Furthermore we find that when interacting the prior mean with the information treatment (T2) an increase in the prior mean of one standard deviation decreases the perceived reform necessity by 22.4% percent of a standard deviation (Panel C, column 4).

Therefore, the information treatment (T2) has a positive and significant effect on all respondents, the full sample as well as respondents from East and West Germany. For the full sample as well as for West German respondents we also find that an increase in prior beliefs leads to a decrease in the perceived reform necessity, which is in line with our hypotheses. The salience treatment (T1) on the other hand has a positive and significant (although smaller) effect on the full sample as well as on West German respondents, while it has no significant effect on East German respondents. We do not find significant effects for the interaction of the salience

<sup>&</sup>lt;sup>6</sup>See Appendix B for the exact wording.





treatment (T1) with the prior beliefs, which does not support our hypotheses that for this treatment an increase in prior beliefs also leads to an increase in reform preferences.

#### 4.2 Preferences towards specific reforms

We also asked respondents to indicate which reform measure they would prefer if they had to choose between two options. These reform measures comprise increasing the retirement age (age), decreasing the pension level (level), increasing contributions (contribution) and increasing the tax subsidy to the statutory pension insurance (tax).<sup>7</sup> Respondents stated their preferences for each of the six pairs which result from the four options. This allowed us to create individual rankings for the four measures, including the most and the least preferred measures. Overall 667 respondents answered to all six questions consistently.<sup>8</sup> Additionally, we identify further 153 respondents for the most preferred measure who always prefer one measure over the three other measures. In an analogous way, we identify 81 additional respondents for the least preferred measure. This results in 820 observations for the most preferred pension reform measure and 748 observations for the least preferred one. The number of consistent answers appears to be quite high. This might be due to the fact that respondents strongly prefer increasing the tax subsidy while at the same time strongly oppose an increase in retirement age. Figure 3 illustrates this. The part on the left depicts the distribution for the most preferred reform measure and the part on the right for the least preferred reform measure. While the figure for the most preferred measure shows that over all three groups a large majority of around 60% prefers increasing the tax subsidy, the figure for the least preferred measure shows that nearly the same share ranks an increase in the retirement age least. The most and the least preferred measures are coded as dummy variables, which take the value 1 if an option is the most or the least preferred measure, respectively, and 0 otherwise.

The results of the pairwise comparisons are shown in Tables 2 and 3. Panel A of Table 2 displays the results for the three trade-off measures increasing the retirement age, decreasing the pension level and increasing the contribution payments to the statutory pension insurance, but abstracting

<sup>&</sup>lt;sup>7</sup>The exact wording of the respective questions is provided in Appendix B.

 $<sup>^{8}</sup>$ We say that someone responds consistently when we can identify a clear preference ranking for the measures based on the six pairwise comparisons.

from an increase in the tax subsidy. For the full sample we find that treatment T1, i.e. the treatment which increases salience about the demographic change without providing the correct information, increases the probability that respondents choose an increase in the retirement age over a decrease in the pension level significantly by up to 13 percent of a standard deviation. When interacting the treatments with the mean of the prior beliefs we find that an increase in the retirement age over decreasing the pension level by 7.6% (T1) to 7.9% (T2) of a standard deviation (Panel A, column 4), with the effect being marginally significant. Furthermore, we find that treatment T2, where information is provided, (marginally) significantly increases the likelihood that respondents prefer an increase in contribution payments over a decrease in the pension level by 7.3% of a standard deviation.

For the East German subsample we barely find any significant effects of either of the treatments, while the effects for West Germany are rather similar to those for the full sample except for the absence of the interaction effect for the choice between increasing the retirement age or decreasing the pension level.

Given the possibility to choose an increase in the tax subsidy for the statutory pension insurance, as shown in Table 3, we find for the remaining three trade-off measures for the full sample that both treatments make it significantly more likely that respondents prefer an increase in the retirement age over an increase in the tax subsidy, while the effect size appears to be larger for the salience treatment T1. Furthermore, we find that the information treatment (T2) has a marginally significant positive effect on the preference to chose an increase in contributions over an increase in tax subsidies by 7.3% of a standard deviation (Panel A, column 5). For all outcomes the interaction of the treatment and the mean of prior beliefs is not significant.

When we analyze these trade-off questions separately for East German respondents we find, similar to the full sample, a positive salience and treatment effect on the question whether an increase in the retirement age is preferred over a increase in the tax subsidy (Panel B, column 1). For West German respondents on the other hand we only find a marginally significant positive effect for the salience treatment (Panel C, column 1).

#### 5 Conclusion

In this paper we use a survey experiment to analyze the salience effect and the information effect for preferences towards pension reforms regarding the German statutory pension insurance. For the perceived general reform necessity of the German pension system we find that especially the information treatment T2 has a positive and significant effect for the full sample as well as for subsamples of respondents from East and West Germany. Furthermore we find for the full sample that an increase in the mean of prior beliefs causes a decrease in the information effect for the full sample as well as for respondents from West Germany. Regarding the specific reform measures both, the salience and the information treatment, have significant effects on respondents preferences towards reforms. The effects point towards an increased preference for an increase in the retirement age and the contributions possibly to avoid reduction of the pension level.

Overall, the results imply that making respondents aware of the demographic change and giving them correct information on the topic can increase the likelihood that they choose reform measures that work towards increasing the financial sustainability of the German statutory pension insurance. As these are in general measures, which are not very popular among the general public, this underlines the role of information provision in the context of pensions. Our study has provided a first step towards a more comprehensive analysis.

	(1)	(2) Refor	(3) m Necessity	(4) v
Panel A: Full Sample				/
T1: Salience	$0.164^{*}$	$0.178^{**}$	$0.166^{*}$	$0.182^{**}$
	(0.088)	(0.085)	(0.087)	(0.084)
T2: Information	$0.228^{**}$	0.225***	0.231***	0.232***
	(0.090)	(0.084)	(0.089)	(0.083)
Prior mean		0.020	0.085	0.071
		(0.037)	(0.059)	(0.052)
T1: Salience $\times$ Prior mean			0.054	0.050
			(0.081)	(0.075)
T2: Information $\times$ Prior mean			$-0.177^{*}$	$-0.195^{**}$
			(0.094)	(0.086)
Controls	No	Yes	No	Yes
Observations	851	851	851	851
Panel B: East Germany				
T1: Salience	-0.081	-0.039	-0.101	-0.045
	(0.131)	(0.132)	(0.132)	(0.132)
T2: Information	$0.249^{*}$	$0.266^{**}$	$0.245^{*}$	$0.269^{**}$
	(0.130)	(0.130)	(0.131)	(0.130)
Prior mean		0.073	-0.028	-0.047
		(0.045)	(0.095)	(0.093)
T1: Salience $\times$ Prior mean			$0.217^*$	0.191
			(0.124)	(0.122)
T2: Information $\times$ Prior mean			0.101	0.129
			(0.119)	(0.116)
Controls	No	Yes	No	Yes
Observations	334	334	334	334
Panel C: West Germany				
T1: Salience	$0.197^{*}$	$0.229^{**}$	$0.208^{**}$	$0.239^{**}$
	(0.105)	(0.103)	(0.104)	(0.101)
T2: Information	$0.222^{**}$	$0.229^{**}$	$0.226^{**}$	$0.236^{**}$
	(0.104)	(0.098)	(0.103)	(0.097)
Prior mean			0.089	-0.031
			(0.067)	(0.104)
T1: Salience $\times$ Prior mean			0.051	0.067
			(0.099)	(0.092)
T2: Information $\times$ Prior mean			-0.198*	-0.224**
			(0.107)	(0.099)
Controls	No	Yes	No	Yes
Observations	517	517	517	517

 Table 1: Necessity of Reforms

Notes: The table shows the treatment effects on perceived reform necessity. Reform necessity is measured on a 7-point Likert scale and it is standardized using mean and standard deviation of the control group. Control variables include age, gender, socialization in East Germany, education, children, employment status, migration background, trust in public institutions, time preference, equality views, optimism towards old-age, interest in old-age provision, occupation with own old-age income, payments of contributions to the statutory pension insurance and the standardized mean of the prior beliefs. We drop outliers with prior beliefs above the 95th or below the 5th percentile. For Panel A we are using a weight that balances the oversampling of respondents from East Germany. Robust standard errors are displayed in parentheses; \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

	(1)	(2)	(3)	(4)	(5)	(6)
	age, not	$\operatorname{contribution}$	age, n	ot level	contribu	tion, not level
Panel A: Full Sample						
T1: Salience	0.038	0.039	$0.129^{***}$	$0.130^{***}$	$0.073^{*}$	$0.073^{*}$
	(0.038)	(0.038)	(0.045)	(0.045)	(0.041)	(0.041)
T2: Information	0.064	0.064	0.054	0.056	0.047	0.046
	(0.040)	(0.040)	(0.046)	(0.046)	(0.043)	(0.043)
Prior mean	-0.016	-0.029	-0.011	0.041	0.020	0.005
	(0.014)	(0.019)	(0.019)	(0.033)	(0.017)	(0.031)
T1: Salience $\times$ Prior mean	· · ·	0.027	( )	-0.076*	· /	0.004
		(0.033)		(0.044)		(0.041)
T2: Information $\times$ Prior mean		0.012		-0.079*		0.042
		(0.034)		(0.046)		(0.040)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	793	793	752	752	783	783
Panel B. East Germany						
T1: Salience	0.047	0.043	0.035	0.033	-0.002	-0.005
11. Suitefiet	(0.017)	(0.052)	(0.066)	(0.067)	(0.065)	(0.065)
T2: Information	(0.052)	0.036	0.000)	(0.001) 0.054	0.019	0.021
12. mormation	(0.052)	(0.056)	(0.015)	(0.068)	(0.015)	(0.021)
Prior mean	0.002	-0.030	(0.001)	0.002	-0.010	0.014
i noi mean	(0.002)	(0.034)	(0.023)	(0.051)	(0.026)	(0.051)
T1: Salience × Prior mean	(0.022)	$0.082^{*}$	(0.020)	-0.029	(0.020)	-0.014
11. Suitefiet × 1 Hor filean		(0.002)		(0.020)		(0.063)
T <sub>2</sub> · Information × Prior mean		-0.006		$-0.102^*$		-0.063
		(0.054)		(0.061)		(0,069)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	308	308	205	205	308	308
	500	300	250	250	500	300
Panel C: West Germany	0.004	0.004	0 1 40***	0 1 10***	0.000*	0.001*
T1: Salience	0.034	0.034	$0.149^{-11}$	0.148	$0.092^{\circ}$	$0.091^{\circ}$
	(0.045)	(0.045)	(0.054)	(0.054)	(0.049)	(0.049)
12: Information	(0.062)	0.062	0.048	0.050	0.054	0.052
	(0.048)	(0.048)	(0.055)	(0.055)	(0.051)	(0.051)
Prior mean	-0.020	-0.025	0.002	0.053	0.025	-0.001
	(0.017)	(0.023)	(0.023)	(0.039)	(0.020)	(0.036)
11: Salience $\times$ Prior mean		0.003		-0.086		0.009
		(0.040)		(0.056)		(0.050)
12: Information $\times$ Prior mean		0.014		-0.071		0.066
	37	(0.040)	V	(0.055)	v	(0.046)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	486	486	457	457	475	475

 Table 2: Pension Reform Measures

Notes: The table shows the treatment effects on the pairwise choices for increasing the retirement age, decreasing the pension level and increasing contributions to the statutory pension insurance. All outcome variables are binary variables. Control variables include age, gender, socialization in East Germany, education, children, employment status, migration background, trust in public institutions, time preference, equality views, optimism towards old-age, interest in old-age provision, occupation with own old-age income, payments of contributions to the statutory pension insurance and the standardized mean of the prior beliefs. We drop outliers with prior beliefs above the 95th or below the 5th percentile. For Panel A we are using a weight that balances the oversampling of respondents from East Germany. Robust standard errors are displayed in parentheses; \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

	(1)	(2)	(3)	(4)	(5)	(6)
	age, n	ot tax	level, 1	not tax	contrib	utions, not tax
Panel A: Full Sample						
T1: Salience	$0.073^{**}$	$0.073^{**}$	-0.034	-0.035	0.034	0.033
	(0.032)	(0.032)	(0.035)	(0.035)	(0.042)	(0.042)
T2: Information	$0.061^{*}$	$0.061^{*}$	0.013	0.014	$0.073^{*}$	$0.072^{*}$
	(0.032)	(0.032)	(0.037)	(0.036)	(0.043)	(0.043)
Prior mean	-0.011	-0.019	0.004	0.036	-0.006	0.002
	(0.012)	(0.015)	(0.014)	(0.025)	(0.018)	(0.029)
T1: Salience $\times$ Prior mean		0.019		-0.049		-0.037
		(0.029)		(0.034)		(0.041)
T2: Information $\times$ Prior mean		0.003		-0.048		0.013
		(0.028)		(0.035)		(0.046)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	827	827	816	816	816	816
Panel B: East Germany						
T1: Salience	$0.084^{**}$	$0.082^{*}$	-0.036	-0.033	-0.036	-0.035
	(0.042)	(0.042)	(0.056)	(0.057)	(0.063)	(0.063)
T2: Information	$0.074^{*}$	$0.075^{*}$	0.004	0.001	0.031	0.030
	(0.045)	(0.045)	(0.061)	(0.061)	(0.068)	(0.068)
Prior mean	-0.021	-0.028	-0.007	-0.010	0.014	0.075
	(0.015)	(0.031)	(0.022)	(0.045)	(0.027)	(0.049)
T1: Salience $\times$ Prior mean		0.021		-0.024		-0.093
		(0.037)		(0.051)		(0.063)
T2: Information $\times$ Prior mean		-0.005		0.047		-0.071
		(0.040)		(0.063)		(0.070)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	321	321	317	317	319	319
Panel C: West Germany						
T1: Salience	$0.071^{*}$	$0.072^{*}$	-0.032	-0.033	0.050	0.048
	(0.039)	(0.039)	(0.041)	(0.041)	(0.050)	(0.050)
T2: Information	0.053	0.053	0.016	0.018	0.076	0.075
	(0.038)	(0.038)	(0.043)	(0.043)	(0.051)	(0.051)
Prior mean	-0.008	-0.016	0.004	0.047	-0.011	-0.016
	(0.015)	(0.018)	(0.017)	(0.029)	(0.023)	(0.034)
T1: Salience $\times$ Prior mean		0.020		-0.059		-0.028
		(0.038)		(0.043)		(0.050)
T2: Information $\times$ Prior mean		0.005		$-0.070^{*}$		0.042
		(0.033)		(0.041)		(0.055)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	506	506	500	500	497	497

Table 3: Pension Reform Measures (incl. tax subsidies)

Notes: The table shows the treatment effects on the pairwise choices for increasing the retirement age, decreasing the pension level, increasing contributions to the statutory pension insurance or increasing tax subsidies. All outcome variables are binary variables. Control variables include age, gender, socialization in East Germany, education, children, employment status, migration background, trust in public institutions, time preference, equality views, optimism towards old-age, interest in old-age provision, occupation with own old-age income, payments of contributions to the statutory pension insurance and the standardized mean of the prior beliefs. We drop outliers with prior beliefs above the 95th or below the 5th percentile. For Panel A we are using a weight that balances the oversampling of respondents from East Germany. Robust standard errors are displayed in parentheses; \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

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# Appendix

# Appendix A - Information Provision Experiment

Wording of belief elicitation questions Old-age provision in Germany is based on the idea that the working generation finances the pensions of people in retirement. Therefore it is important to look at the ratio of people of retirement age starting from 65 years of age to people of working age between 20 and 64 years of age. In the year 1990, there were 24 people of retirement age for every 100 people of working age.

What do you estimate: in 2020, how many people of retirement age are there for every 100 people of working age?

And what do you estimate: in 2050, how many people of retirement age will be there for every 100 people of working age?

# Feedback + Information (Treatment group T2)

You have estimated xyz for 2020 and abc for 2050 [insert estimates here], the correct answers are 37 for the year 2020 and 55 for the year 2050. There are thus currently about three people of working age for every person of retirement age, and that there will be more and more people of retirement age and fewer and fewer people of working age.

Estimation xyz (2020):

- Correct (33 41): So your estimate of xyz for the year 2020 was pretty accurate.
- Overestimated (41 <): So your estimate of xyz for the year 2020 was too high.
- Underestimated (< 33): So your estimate of xyz for the year 2020 was too low.

## Estimation abc (2050):

- Correct (51 59): So your estimate of *abc* for the year 2050 was pretty accurate.
- Overestimated (59 <): So your estimate of *abc* for the year 2050 was too high.
- Underestimated (< 51): So your estimate of *abc* for the year 2050 was too low.

Variable name	Type	Description
Reform Necessity	Numerical (1 – 7)	Perceived reform necessity based on the question "Do you think that reforms are necessary for the German pen- sion system?" With answer options from 1 "no reforms necessary" to 7 "comprehensive reforms necessary.
age, not contribution	Dummy	=1, if increasing the retirement age is preferred over increasing contributions based on the question "Should the retirement age be raised or the contribution rate be increased?"
age, not level	Dummy	=1, if increasing the retirement age is preferred over decreasing the pension level based on the question "Should the retirement age be increased or the pension level be decreased?"
contribution, not level	Dummy	=1, if increasing the contributions is preferred over de- creasing the pension level based on the question "Should the contribution rate be increased or the pension level be decreased?"
age, not tax	Dummy	=1, if increasing the retirement age is preferred over increasing the tax subsidy based on the question "Should the tax-financed federal subsidy to the statutory pension insurance be increased or the retirement age be increased?"
level, not tax	Dummy	=1, if decreasing the pension level is preferred over in- creasing the tax subsidy based on the question "Should the tax-financed federal subsidy to the statutory pension insur- ance be increased or the contribution rate be increased?"
contribution, not tax	Dummy	=1, if increasing the contribution rate is preferred over increasing the tax subsidy based on the question "Should the tax-financed federal subsidy to the statutory pension insurance be increased or the pension level be lowered?"
Age old $(50+)$	Dummy	=1, if age is 50 or above
Female	Dummy	=1, if gender is female
East	Dummy	=1, if respondent lives in East Germany
East socialization	Dummy	=1, if either the person itself or at least one of the parents lived in East Germany before November 1989, i.e. the time of the fall of the wall
Educ: 12th grade	Dummy	=1, if school degree after 12th grade
Educ: uni	Dummy	=1, if respondent has an university degree

# Appendix B - Relevant Variables

Variable name	Туре	Description
Risk attitude	Numerical $(1-7)$	"How willing are you to take risks in money and financial
		matters?" Answer options range from 1 "not at all willing
		to take risks" to 7 "very willing to take risks"
Trust: own decision	Numerical $(1-7)$	Trust in own decisions based on the question "How much
		do you trust yourself in making the right decisions for
		your old-age provision?" Answer options range from $1$
		"not at all" to 7 "fully"
Trust: finance	Numerical $(1-7)$	Trust in private financial service providers based on the
		question "Do you think that banks, insurance companies
		and other financial service providers in Germany can be
		$trusted \ref{eq:relation}$ Answer options range from 1 "I do not trust
		them at all" to 7 "I trust them completely"
Trust: public	Numerical $(1-7)$	Trust in public institutions based on the question "Do $you$
		think that the public institutions in Germany relevant to
		old-age pension, such as the German Pension Insurance
		or the Federal Ministry of Labor and Social Affairs, can
		be trusted?" Answer options range from 1 "I do not trust
		them at all" to 7 "I trust them completely"
Employed	Dummy	=1, if employed
Migration Background	Dummy	=1, if respondent has migration background
Married	Dummy	=1, if respondent is married or in a registered same-sex $% \left( {{{\mathbf{x}}_{i}}} \right)$
		partnership
Children	Dummy	=1, if respondent has children
Household Size	Numerical	Number of people in the household
Contributions SPI	Dummy	=1, if respondent pays contributions to the statutory
		pension insurance
Time Preference	Numerical $(1 - 7)$	Time preference based on the question "Since you don't
		know how long you will live, you should rather spend your
		money to-day than save for old age." Answer options
		range from 1 "do not agree at all" to 7 "agree completely".
Equality Preference	Numerical $(1-7)$	Equality Preference based on the question "The state
		should ensure greater equality of financial living conditions
		in old age." Answer options range from 1 "do not agree
		at all" to 7 "agree completely".
Optimistic	Dummy	=1, if respondent states that they look quite optimistic
		or more optimistic than pessimistic at their life in old age
Interest	Numerical $(1-7)$	Interest in Old-age provision based on the question $``How$
		interested are you in the topic of old-age provision?" An-
		swer options range from 1 "no interest at all" to 7 "very
		high interest"

Variable name	Type	Description
Income Receive	Dummy	=1 if the respondents answers yes to the question "Have you already gathered information about how much income you will receive in retirement?"

A.1: Descriptive overview of variables.

# Appendix C - Balance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All	$\mathbf{C}$	T1	C vs. T1 $$	T2	C vs. T2 $$	T1 vs. T2 $\mathbf{T}$
	Mean	Mean	Mean	p-Value	Mean	p-Value	p-Value
Age old $(50+)$	0.47	0.50	0.45	0.21	0.45	0.28	0.88
Female	0.50	0.51	0.49	0.56	0.50	0.79	0.75
East	0.40	0.38	0.42	0.36	0.39	0.75	0.54
East socialization	0.43	0.40	0.44	0.31	0.45	0.19	0.76
Educ:12th grade	0.54	0.55	0.52	0.44	0.57	0.66	0.22
Educ: uni	0.34	0.35	0.34	0.79	0.35	0.92	0.71
Risk attitude	3.06	3.12	3.00	0.38	3.09	0.82	0.51
Trust: finance	3.82	3.79	3.84	0.68	3.82	0.79	0.89
Trust: own decision	5.15	5.19	5.14	0.66	5.12	0.60	0.91
Children	0.67	0.70	0.64	0.14	0.67	0.38	0.56
Employed	0.84	0.83	0.84	0.71	0.84	0.62	0.89
Migration Background	0.14	0.13	0.16	0.31	0.13	0.98	0.31
Married	0.52	0.56	0.53	0.44	0.46	$0.02^{**}$	0.11
Household size	2.54	2.59	2.50	0.39	2.54	0.63	0.70
Trust: public	4.45	4.40	4.51	0.42	4.44	0.77	0.62
Time Preference	2.94	3.05	2.89	0.29	2.88	0.25	0.95
Financial Equality	5.00	5.01	5.00	0.91	5.00	0.94	0.96
Contributions SPI	0.88	0.88	0.87	0.77	0.89	0.63	0.43
Optimism Old-Age	0.57	0.57	0.58	0.86	0.56	0.73	0.60
Interest topic	4.75	4.72	4.70	0.87	4.85	0.40	0.29
Amount Old-Age Income	0.76	0.78	0.76	0.47	0.75	0.33	0.78
Observations	856	268	306	574	282	550	588

Notes: This table shows the mean for the full Germany sample as well as for each of the experimental groups. Furthermore, p-values of the comparison between groups resulting from t-tests are shown; \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

A.2: Balance Tests - Germany

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All	$\mathbf{C}$	T1	C vs. T1 $$	T2	C vs. T2 $$	T1 vs. T2 $\mathbf{T}$
	Mean	Mean	Mean	p-Value	Mean	p-Value	p-Value
Age old $(50+)$	0.46	0.46	0.45	0.86	0.45	0.84	0.97
Female	0.48	0.46	0.49	0.68	0.49	0.75	0.93
Educ:12th grade	0.49	0.49	0.44	0.39	0.54	0.51	0.11
Educ: uni	0.33	0.38	0.30	0.21	0.30	0.19	0.90
Risk attitude	2.98	2.87	3.06	0.36	2.99	0.59	0.73
Trust: finance	3.77	3.59	3.89	0.16	3.80	0.34	0.65
Trust: own decision	5.06	5.20	4.88	0.10	5.14	0.74	0.18
Children	0.67	0.69	0.68	0.91	0.65	0.56	0.61
Employed	0.82	0.82	0.80	0.80	0.84	0.71	0.51
Migration Background	0.09	0.06	0.13	0.10	0.09	0.42	0.39
Married	0.49	0.51	0.51	0.97	0.47	0.60	0.55
Household size	2.45	2.34	2.41	0.70	2.60	0.13	0.23
Trust: public	4.39	4.29	4.49	0.39	4.35	0.81	0.53
Time Preference	3.04	3.07	3.18	0.67	2.86	0.40	0.17
Financial Equality	5.13	5.11	5.15	0.88	5.14	0.92	0.95
Contributions SPI	0.90	0.91	0.88	0.42	0.92	0.80	0.27
Optimism Old-Age	0.50	0.49	0.48	0.88	0.51	0.79	0.65
Interest topic	4.75	4.72	4.59	0.61	4.95	0.33	$0.10^{*}$
Amount Old-Age Income	0.73	0.80	0.70	0.11	0.70	0.11	0.99
Observations	338	99	128	227	111	210	239

Notes: This table shows the mean for the East German sample as well as for each of the experimental groups. Furthermore, p-values of the comparison between groups resulting from t-tests are shown; \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

A.3: Balance Tests - East Germany

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All	$\mathbf{C}$	T1	C vs. T1 $$	T2	C vs. $T2$	T1 vs. T2 $\mathbf{T}$
	Mean	Mean	Mean	p-Value	Mean	p-Value	p-Value
Age old $(50+)$	0.47	0.52	0.44	0.17	0.45	0.24	0.87
Female	0.51	0.54	0.48	0.33	0.51	0.65	0.60
Educ:12th grade	0.58	0.58	0.57	0.83	0.59	0.87	0.70
Educ: uni	0.36	0.33	0.36	0.55	0.39	0.22	0.51
Risk attitude	3.13	3.28	2.98	$0.07^*$	3.13	0.38	0.35
Trust: finance	3.85	3.89	3.80	0.60	3.86	0.85	0.76
Trust: own decision	5.21	5.20	5.31	0.48	5.12	0.64	0.24
Children	0.67	0.71	0.62	$0.08^{*}$	0.68	0.54	0.26
Employed	0.85	0.83	0.87	0.36	0.85	0.66	0.63
Migration Background	0.17	0.17	0.18	0.72	0.15	0.66	0.42
Married	0.54	0.61	0.54	0.25	0.46	$0.01^{***}$	0.12
Household size	2.61	2.76	2.57	0.18	2.50	$0.08^{*}$	0.65
Trust: public	4.50	4.47	4.52	0.77	4.52	0.80	0.98
Time Preference	2.88	3.04	2.73	0.11	2.88	0.40	0.43
Financial Equality	4.93	5.00	4.89	0.58	4.91	0.64	0.93
Contributions SPI	0.87	0.87	0.87	0.90	0.88	0.77	0.87
Optimism Old-Age	0.62	0.62	0.64	0.65	0.59	0.61	0.32
Interest topic	4.75	4.70	4.77	0.73	4.78	0.70	0.95
Amount Old-Age Income	0.78	0.77	0.80	0.51	0.78	0.86	0.63
Observations	518	166	180	346	172	338	352

Notes: This table shows the mean for the West German sample as well as for each of the experimental groups. Furthermore, p-values of the comparison between groups resulting from t-tests are shown; \* p < 0.10, \*\*\* p < 0.05, \*\*\* p < 0.01.

A.4: Balance Tests - West Germany