

# Rich vs Poor: inequality perceptions, information and redistributive policy support\*

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This Version: July 2021  
(This draft compiled: July 15, 2021)

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## Abstract

This paper contributes to the study of how information on and perceptions of inequality matter for policy support. Using a survey experiment, we provide respondents with information on actual inequality. We focus on both the top and the bottom of the income distribution. We have two separate treatments, one provides information on the share of income going to the richest 10% of all households, the other on the share going to the poorest 10%. This allows us to investigate if and how a rich or poor priming and the relative information treatments affect support for redistribution attitudes and policy preferences. We further examine one way how information affects attitudes and preferences, namely via shifting perceptions of inequality. Three main results emerge from our analyses: First, there is a priming effect of pointing people towards focusing on the rich vs. the poor. Second, information on the upper end of the distribution shifts policy support more than information on the lower end. Third, changes in inequality perceptions have an effect on concrete policy proposals, but do not affect general attitudes towards redistribution. Our results help explain why previous findings are ambiguous: it matters what specific information on inequality is provided and the effects differ depending on the specificity level of the policy for which support is studied.

*JEL classification:* D3, D6, H2.

*Keywords:* Income Inequality, Preference for Redistribution, Income Tax, Wealth Tax, Survey Experiments.

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\*We would like to thank Konstantin Mozer for his exceptional support in the survey implementation, Kattalina Berriocha for her invaluable help with the SOEP database and Sarah Fenzl and Marie-Sophie Houben for their excellent research assistance. This project is funded by the Deutsche Forschungsgemeinschaft (DFG - German Research Foundation) under Germany's Excellence Strategy -EXC-2035/1 - 390681379. Usual disclaimers apply.

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# 1 Introduction

Existing inequality should matter for people's preferences towards redistribution. This assumption is found in such well-known models as the Meltzer-Richard model, which expects demand for redistribution to be positively related to inequality (Meltzer and Richard, 1981). Yet empirical support for these expectations is scant (see Bellani et al., 2019, for a recent review).

One major explanation for this is that people's perception of the state of the world may differ substantially from actual objective facts. If people do not realize that society-wide inequality is rising or if they misjudge where they themselves are in the income distribution, the expectation that they adjust their preferences according to these objective facts is misplaced. Recent work suggests that people are indeed frequently inaccurate, both in estimating their own income position as well as in their perception of the income distribution in society. As has been increasingly argued, it is therefore important not only to consider individual preferences for redistribution and policies impacting inequality, but also to explicitly investigate how people actually perceive inequality and how perceptions and preferences are related.

This paper adds to the debate by providing new evidence on the causal effect of information about and perceptions of inequality in the society on attitudes towards general redistribution and support for specific policies, for the case of Germany. Comparing general attitudes and support for specific policies is crucial, since to what extent these are affected by perceptions may differ, as we indeed find. A further innovative aspect of our paper is that we differentiate between individual perceptions of the distribution focusing on the lower end and the upper end. In the first case, the focus is on what inequality means in terms of what the poorest 10% get, in the second case the focus is on what it means in terms of what the richest 10% get. This is important for two reasons: firstly, information focusing on the top or the bottom may have different effects, both of which are interesting in their own right. Secondly, merely being made to think about one or the other can have priming effects – it is therefore important to be able to take this into account. Having both variations enables us to do so. Using a survey experiment, we look at the effect of providing information at these two levels on general preferences for redistribution, as well as preferences for a higher income tax and support for the introduction of a wealth tax. These innovations are made possible by the use of a new dataset, the *Inequality Barometer*, stemming from a large survey we recently conducted.

We find that there is a priming effect of focusing on the top vs. the bottom. Those who are primed to focus on the rich are more likely to support redistribution through the state and the introduction of a wealth tax. Concerning the information treatment, we find that people respond more to information on the upper end of the redistribution. Respondents who learn that the proportion going to the upper end is smaller than they think, reduce their support for redistribution through the state, for higher income taxes, and for the introduction of a wealth tax. Yet it is notable that the effect sizes are slightly smaller than the priming effect. Examining the causal effect via perceptions we firstly find that our information treatment indeed shifts perceptions of inequality, but only in the case of the rich-households treatment. The shift in perceptions, in turn, has an effect on preferences concerning concrete policy proposals, namely income taxes and a wealth tax. However, we do not find average causal effects for general attitudes concerning the role of the state in redistribution.

Overall, our findings shed light on the ambiguity of previous findings: the effect of information depends on the specificity of policy preferences and on whether information on the rich or on the poor is provided. Further, priming people to think about the rich or the poor also plays a role and needs to be taken into account.

The paper is structured as follows: we first discuss recent literature and results on perceptions of inequality and their relation to policy preferences. We also briefly describe our conceptual considerations. We go on to discuss our data, our experimental design, and our identification strategy. Subsequently, we present the results, first describing the framing and the intent-to-treat effect, and second the causal mechanism. Finally, we discuss the implications of these findings and conclude.

## **2 Existing literature and conceptual considerations**

Inequality is a multifaceted phenomenon and consequently there are multiple aspects that can be perceived accurately or inaccurately.<sup>1</sup> Firstly, well-known social science models, such as, paradigmatically, the Meltzer-Richard model, assume that people know their position in the income distribution relative to the median. However, existing literature finds that people tend to cluster in the middle: poorer people overestimate their position, while richer people underestimate it (Gimpelson and Treisman, 2018; Fernández-Albertos and Kuo, 2018; Engelhardt and Wagener, 2018; Bublitz,

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<sup>1</sup>Inaccurately is here meant as differing from what objective measures say. Yet given the intricacies of measuring inequality, the extent to which there is actual knowledge of the ‘true’ degree of inequality is limited (see, for example, Gimpelson and Treisman, 2018).

2016; Cruces et al., 2013). Whether on average people over- or underestimate their relative income position appears to depend on the country context, although overall underestimating one's position is more dominant (Bublitz, 2016; Karadja et al., 2017).

Factors other than material self-interest may play a role in shaping people's policy demands regarding inequality as well, such as sociotropic or altruistic preferences. Models arguing that such concerns play a role generally need to assume that people have an idea of what society-wide inequality looks like. Existing evidence indicates, however, that people's perception here is also frequently inaccurate. When people in multiple countries were shown diagrams of different 'shapes of society' and asked which one best represents their country, about three quarters of respondents gave an inaccurate answer (Gimpelson and Treisman, 2018; Engelhardt and Wagener, 2018). While in some countries people underestimated inequality in others they overestimated it (Gimpelson and Treisman, 2018; Engelhardt and Wagener, 2018; Chambers et al., 2013). In the case of Germany, Engelhardt and Wagener (2018) find that, out of five possible diagrams, most respondents do not choose the closest one to the actual distribution in Germany and that respondents tend to overestimate overall inequality. In the US, on the other hand, people appear to substantially underestimate the degree of inequality (Gimpelson and Treisman, 2018; Norton and Ariely, 2011), although there is also conflicting evidence, see Chambers et al. (2013); Eriksson and Simpson (2012).<sup>2</sup> Instead of relying on the somewhat indirect 'shapes of society' measure, other studies ask for the perceived proportion of wealth or income that is owned or earned by different groups. When asked what percentage of wealth the richest 1% own, the average respondent was wrong by 17 percentage points, often overestimating the share (Gimpelson and Treisman, 2018). Stantcheva (2020) finds less overestimation of the proportion of wealth going to the richest 1%, but finds that the amount of income earned by the top 1% is overestimated by 25 percentage points on average. Country specific studies also provide mixed results: while Norton and Ariely (2011) find that people in the US underestimate the share of wealth owned by the richest 20%, Chambers et al. (2013) find, looking at income, that people overestimate the gap between the richest and the poorest 20%, and that this is due to overestimating the income of the top 20%.

Besides understanding how people perceive inequality, it is vital to study how these perceptions are related to whether people think inequality is legitimate, to their attitudes towards redistribution, and to policy preferences. Given the centrality of people's knowledge of both their position in the distri-

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<sup>2</sup>For a reply to Eriksson and Simpson's criticism of Norton and Ariely's study see Norton and Ariely (2013).

bution and of society-wide inequality for central political economy models, the substantial divergence between perceptions and the actual extent of inequality is likely to have important implications for policy preferences and therefore, ultimately, for government responses to public demands.

Conducting a simple regression exercise on cross-country data, Niehues (2014) finds that higher perceived inequality is significantly related to people stating that inequality is too high, as well as to higher support for redistribution. These relations do not hold up when actual inequality is used as a predictor. Yet the strength of conclusions that can be drawn from this type of data is, of course, limited. In order to better identify the effect of the discrepancy between perceptions and actual inequality, survey experiments can be employed. Kuziemko et al. (2015) find that respondents' concern with inequality is increased substantially, if they receive information on the actual level of inequality (this holds for information both on their relative perception as well as overall inequality). Conversely, Trump (2018) finds that if people's perception of inequality is corrected upward, they tend to accept a higher level of inequality as legitimate, which she argues is due to system justification.

With regard to policy preferences evidence is equally mixed. For the Swedish case, Karadja et al. (2017) find that if people learn that they are relatively richer than they thought (around 70% underestimate their income position), they tend to demand less redistribution. Cruces et al. (2013), on the other hand, find (for the Argentinian case) that particularly those people who learn they are poorer change their redistribution preferences, supporting more redistribution. The effect of correcting people's bias appears to also depend on individual characteristics, such as ideology (Karadja et al., 2017; Alesina et al., 2018). Brown-Iannuzzi et al. (2015) find that, besides people's perceived position on the income scale, a more general subjective socio-economic status matters as well, and is negatively related to support for redistribution. Looking at multiple countries, Bublitz (2016) finds evidence of an effect of bias correction only for Germany: people who receive information on the overall distribution of inequality and their own position (which they mostly underestimate) increase their preferences for larger income differentials, and are more in favor of people taking responsibility rather than the government. Engelhardt and Wagener (2018), on the other hand, find few treatment effects for Germany: support for more redistribution is high across all income groups, and remains largely unchanged when the (substantial) bias regarding general inequality and people's position on the income scale (which is mostly underestimated) is corrected. When informing people whether they are likely to be a net contributor to or beneficiary from the German tax-transfer system, however, those who learn they are

net contributors support redistribution less.

Much of the literature studying the relation between inequality perceptions and policy preferences focuses on general policy preferences. Some scholars, such as Kuziemko et al. (2015) do look at a range of different, more specific policy preferences. They find, for the US case, that updating people's information on inequality has very limited effects on support for increasing the top income tax rate, minimum wages, or expanding transfers to the poor – only estate tax preferences appear to be susceptible to change through information. The results of a survey experiment in Spain conducted by Fernández-Albertos and Kuo (2018), on the other hand, do indicate effects on tax progressivity. Looking at attitudes towards income and estate taxes in the US, Stantcheva (2020) administers three different intricate information treatments, which combine information on actual inequality with aspects of reasoning about taxes, focusing on efficiency, redistribution or the trade-off between the two. She finds that what seems to be related most closely to views on these taxes is concerns about equity and redistribution. She further finds that misperceptions (of both the tax rates and the percentage of income/wealth belonging to the richest 1%) also play a role. The extent to which existing redistribution through these taxes is overestimated is positively related to attitudes, but it is more related to perceptions of the status quo tax systems as fair, than to more fundamental views on the tax system.

In this paper we add to the literature in two ways. Firstly, we provide new evidence for the impact of information on inequality attitudes and preferences for the German case. In contrast to existing studies we are able to differentiate between a focus on the top and on the bottom of the distribution, i.e. the rich and the poor. Omitting this distinction may be a reason for the ambiguous results in the existing literature. Further, one main way in which information about inequality is likely to influence attitudes and preferences is by changing perceptions of inequality. In a second step we also provide evidence on this causal mechanism of inequality perceptions on attitudes towards redistribution and policy preferences. As will be described in the following section, our data allows us to distinguish between general attitudes towards redistribution and specific redistributive policies, in particular tax policies. Distinguishing between more specific policy preferences and general attitudes and comparing the different effects information may have on these can also help shed light on the inconclusive results in the existing literature.

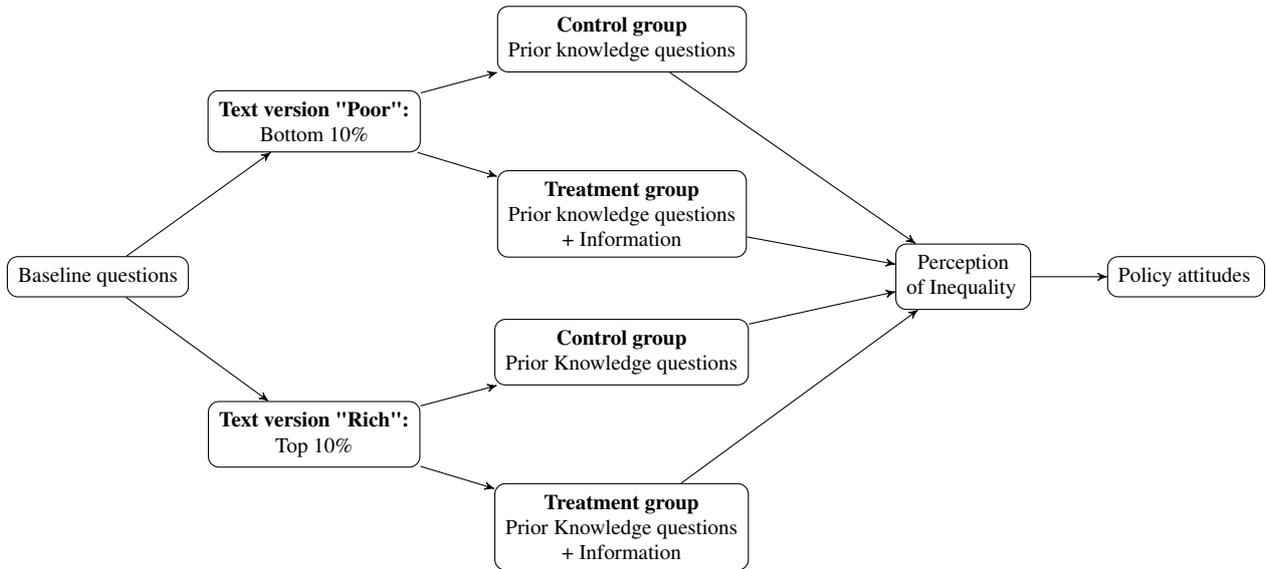


Figure 1: Experimental Design

### 3 Data

The data we use stems from the *Inequality Barometer*, an original survey we conducted together with a team of researchers in the autumn of 2020.<sup>3</sup> The core objective of the survey was to study subjective perceptions and normative evaluations of inequality and social mobility, as well as their relation to policy preferences. It was conducted with a sample from the adult population in Germany, with more than 6000 respondents. The sample is representative in terms of age, education and gender at the NUTS-2 level. More details on the survey can be found in Bellani et al. (2021a) and Bellani et al. (2021b).

One special feature of the *Inequality Barometer* is that it combines a large sample with the possibility of conducting survey experiments. The item this paper mainly draws from consists of a survey experiment, in which respondents were first asked to indicate their perception of the distribution of income and were, in the case of the treatment group, subsequently provided with information on the actual distribution. Because of the large sample, we were able to split the treatment. There are two types of treatment: one variant focuses on the poorest 10% and the other on the richest 10%. This allows us to gauge whether information focusing on one of the two tails of the distribution has a stronger influence on perceptions and is more closely associated with policy preferences.

In a first step half of the respondents were randomly assigned to the text version “rich” and half to

<sup>3</sup>More detail on the project can be found here: <https://www.exc.uni-konstanz.de/en/inequality/topics/the-inequality-barometer/>

the text version “poor”, within these two groups the respondents were randomly assigned to either the control or the treatment group. Figure 1 shows the experimental design, displaying in particular how randomization was applied.

Our prior knowledge question consists of asking for the perceived income distribution, focusing either on the richest or the poorest 10% in society, depending on the group.<sup>4</sup> Eliciting perceptions of society-wide inequality is not easy; multiple hurdles, such as the problem that many respondents have a hard time conceptualizing percentages, need to be addressed.<sup>5</sup> After careful pretests, we settled on the following question format.<sup>6</sup> We asked respondents what percentage, out of the overall income in Germany, they thought either the poorest or the richest 10 households, out of 100 households representing the population in Germany, earn. The question text is: “Now, please think about the net income in Germany. Imagine 100 households, representing the German population. What do you think, what is the percentage of the overall income in Germany that the poorest/richest 10 households earn?”<sup>7</sup> The answer options consisted of a slider, which could be moved to indicate amounts between 0 and 100. Below the slider, an additional sentence was displayed, repeating the answer given in the slider, with the corresponding value adjusting itself as the slider moved: “The poorest/richest 10 households earn [slider value] percent of the overall income in Germany”.<sup>8</sup> The information treatment received by the treatment group consisted of an analogous sentence, with the actual values. The information treatment for the poorest 10 households in Germany, for example, is: “In Germany the poorest 10 households receive 2.5% of the overall income”.<sup>9</sup>

As displayed in Table 1, on average the respondents have an inaccurate view of society wide inequality.<sup>10</sup> The majority of respondents overestimate the income share that the 10 households receive – independent of whether the question asks for the richest or the poorest households. This means that

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<sup>4</sup>We asked for the perceived income distribution on three geographical levels: Germany, the EU, and the Bundesland a respondent resides in. The order in which we asked for the levels was randomized. On which level treatment occurred was also randomized. The structure of randomization was such that the level on which the treatment occurred was the last of the levels to be asked for. The geographical levels are thus orthogonal to the top/bottom split and can be set aside in this paper.

<sup>5</sup>In fact, the challenges to measuring are such that Hadavand (2018) argues that part of the discrepancies observed between objective and subjective measures of inequality may be due to mismeasurements of the latter.

<sup>6</sup>The example is for the level of Germany, the questions and treatments for the other levels are analogous.

<sup>7</sup>The original text in German is: “Denken Sie jetzt bitte an Nettoeinkommen in Deutschland. Stellen Sie sich 100 Haushalte vor, die die Bevölkerung in Deutschland repräsentieren. Was glauben Sie, wie viel Prozent des Gesamteinkommens in Deutschland bekommen die ärmsten/reichsten 10 Haushalte?”

<sup>8</sup>The original text in German is: “Die ärmsten/reichsten 10 Haushalte bekommen [Slider-Wert] Prozent des Gesamteinkommens in Deutschland”.

<sup>9</sup>The original text in German is: “In Deutschland bekommen die ärmsten 10 Haushalte 2.5% des Gesamteinkommens”

<sup>10</sup>The value of all our treatments together with the percentage of respondents who overestimate the share can be found in Tables A1 and A2 in the Appendix, respectively.

Table 1: Percentage of respondents who overestimate the share by treatment

	Bottom 10%	Top 10%	Difference
Control	0.82	0.71	0.11***
Treated	0.80	0.71	0.10***
Difference	0.02	0.00	

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

in one case inequality tends to be overestimated, while in the other case it tends to be underestimated. This further implies that for the majority of the group that received the poor households framing, our treatment should correct their perception of inequality upward, while for most respondents who received the rich households frame it should correct it downward. This entails that we cannot clearly distinguish the difference in receiving information on the upper vs. the lower end, from the difference in learning that inequality may be higher than initially perceived vs. it being lower. Yet, the dominant tendency should be the upper compared to the lower end, since for about 20% of the respondents the bottom-treatment does imply correcting their inequality perceptions downward and for roughly 30% of respondents the top-treatment does mean that they learn inequality is actually higher. The issues of interpretation will be considered further in the discussion section.

The large proportion of people who overestimate both what the poorest 10% as well as the richest 10% earn, may be partly due to the problems many people have in dealing with percentages. However, we compared the answer pattern to another variable in our data that asks for inequality perceptions in a more simple way. Before the treatment, we asked how high the difference in income between the richest 10% and the poorest 10% is perceived to be, not in a "quantitative" but in a "qualitative" way, with five answer categories: no difference, rather small, small, rather large, large. We find that the answer patterns to both questions are consistent: those respondents who think this difference is very big are less likely to overestimate what proportion of the overall income goes to the bottom, while the respondents who think this difference is not that big are more likely to overestimate what goes to the poor in our slider question, and less likely to overestimate the proportion going to the rich.

A further variable important in our analysis is agreement with the statement that the differences in society are too big, which was asked after the treatment and which we are therefore going to use to assess the impact of our information treatment on inequality perceptions. If the information treatment shifts agreement with the statement that differences are too big we interpret this as a change in

perceptions of inequality.

Concerning other dependent variables, the *Inequality Barometer* has the additional advantage of including a range of different policy preferences, including both preferences regarding the more general role of the state in inequality related matters, as well as more specific redistribution policies. The first set consists of a module capturing agreement with statements about the role of the state. Here we look in particular at a statement concerning the task of reducing the difference between people with high and people with low incomes. There are four answer options, expressing complete and partial disagreement and agreement with this being the task of the state.<sup>11</sup> The set of variables measuring preferences concerning more specific policies consists of a question on income tax and a question on the introduction of a wealth tax. The first question inquires about willingness to pay more income tax in order to decrease inequality in Germany. There are four answer options, no, tendency towards no, tendency towards yes, and yes. The question asking about support for a wealth tax has five answer categories ranging from strong opposition to strong support.<sup>12</sup> We also include a range of controls, including age, income and gender (for the full list of controls see tables A6 and A7 in the Appendix).

#### 4 Identification strategy

In the first part of our empirical analysis we look at the effect of our treatments on attitudes and policy preferences. Our main identification strategy is based on the random assignment of the treatments. This allows us to estimate the causal effect of priming individuals about the top or the bottom of the distribution and of showing the correct information about the share of income going to the bottom or the top of the distribution, respectively. From tables A6 and A7 in the Appendix it is evident that randomization worked in both cases, as we find hardly any significant differences on the large set of observable characteristics between the different groups.

We therefore estimate the following model with ordinary least squares:

$$Support_{ij} = \alpha_0 + \alpha_1 Treat_i + \alpha_2 Text_i + \alpha_3 Treat_i * Text_i + \mathbf{X}'_i \alpha_4 + u_i \quad (1)$$

where  $Support_{ij}$  is the degree of support for one of our policy proposals or statements  $j$ ,  $Treat_i$  is

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<sup>11</sup>In section 5.1 we look at similar statements concerning the task of addressing inequality in higher education.

<sup>12</sup>In section 5.1 we look at additional income tax questions and a question concerning inheritance tax.

an indicator of belonging to the treatment group,  $Text_i$  is an indicator of receiving the text version "poor" or "rich",  $\mathbf{X}_i$  is the vector of control variables<sup>13</sup>,  $u_i$  is a random error term.

Besides examining the effect of the treatments on policy preferences, our setting allows us to look into one mechanism through which the information may affect general redistributive preferences and support for specific policies, namely through shifting the perception of inequality. This constitutes the second part of our empirical analysis. To identify the effects of changes in inequality perceptions on policy preferences we use an Instrumental Variable Approach. We use the information treatment as an exogenous shift of respondents' perceptions of inequality, i.e. their response to the question whether income gaps are perceived as too high. In the first stage we regress the perception of inequality on the information treatment. In the second stage we then use predicted values of this perception as the independent variable, with our various policy preferences as dependent variables. This means in these models we estimate a local treatment effect only for compliers, i.e. those respondents for whom the treatment actually changes perceptions. Our model is as follows:

$$Support_{ij} = \beta_0 + \beta_{1j}\widehat{Perception}_i + \mathbf{X}'_i\boldsymbol{\beta}_3 + \epsilon_{ij}, \quad (2)$$

$$Perception_i = \alpha_0 + \alpha_1Treat_i + \alpha_2Text_i + \alpha_3Treat_i * Text_i + \mathbf{X}'_i\boldsymbol{\alpha}_4 + u_i \quad (3)$$

where  $Perception_i$  refers to the individual agreement with our statement about income gaps being too high while  $\widehat{Perception}_i$  is the predicted value of  $Perception_i$  from the first stage and  $u_i, \epsilon_{ij}$  are random error terms.

## 5 Effect of the information treatment

Before delving into the analysis of treatment effects we briefly describe the distribution of our outcome variables (see also column(1) in tables A3 to A5 in the Appendix). Regarding the general role of the state concerning redistribution, the majority of respondents agree at least somewhat that the state should be responsible; 80% are in agreement, with slightly more people stating that they partially agree than stating that they completely agree. Concerning a higher income tax, respondents are much less favorably disposed, a majority of respondents is rather unwilling. Almost 70% of respondents either claim they would be unwilling to pay higher income taxes to reduce inequality or tend towards

<sup>13</sup>A list of the variables we use can be found in Table A6 in the Appendix

being unwilling. On the question regarding the introduction of a wealth tax opinions are more evenly distributed. Slightly more than a third either support or are against such a tax, while slightly less than a third is indifferent.

Table 2: Average Treatments Effects

	(1)	(2)	(3)	(4)	(5)	(6)
	Income Redistribution		Income Tax		Wealth tax	
Treated	0.017	0.018	0.056	0.048	0.077*	0.069
	(0.703)	(0.668)	(0.199)	(0.268)	(0.072)	(0.102)
Text Version Rich	0.091*	0.102**	0.033	0.027	0.107**	0.100**
	(0.541)	(0.608)	(0.027)	(0.025)	(0.038)	(0.048)
Treated $\times$ Text Version Rich	-0.093	-0.105*	-0.112*	-0.106*	-0.169***	-0.165***
	(0.127)	(0.077)	(0.071)	(0.084)	(0.005)	(0.005)
controls	No	Yes	No	Yes	No	Yes
Observations	5,622	5,622	5,544	5,544	5,784	5,784

*p*-values in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

In the first step of the analysis we look at the effect of being primed either to focus on the upper or the lower end of the distribution. The priming effect is visible in comparing the two control groups, one of which receives the “rich framing” and the other of which receives the “poor framing” (this is represented  $\alpha_2$  in equation 1, see section 4) . The results<sup>14</sup> shown in figure 2 indicate that receiving the version focusing on the rich (but not the treatment) has a positive effect on agreeing that it is the role of the state to reduce income inequality. This also holds for the question concerning a wealth tax. For the income tax question there is no significant priming effect. Overall priming appears to play a role: making the respondents think about the top end of the distribution affects their answers compared to having them focus on the bottom end, increasing their support by around 10% of a standard deviation (2.3% and 4.9% at the mean for income redistribution and wealth tax, respectively)

We go on to look at the effect of receiving the information treatment. This is in fact an intention to treat effect, since it includes not only those who actually read the statement, but everyone for whom the information was shown on the screen. Moreover this effect, does not distinguish between respondents with different previous knowledge. In fact, with our data, we can only distinguish between respondents being correct or not in their guess (and we know that on average 76% of them are over-estimating the share), but we cannot distinguish between respondents who are more or less convinced about their guess.

In figure 3 we show the marginal effect of receiving information on the upper end of the distribution

<sup>14</sup>The full results are presented in table 2

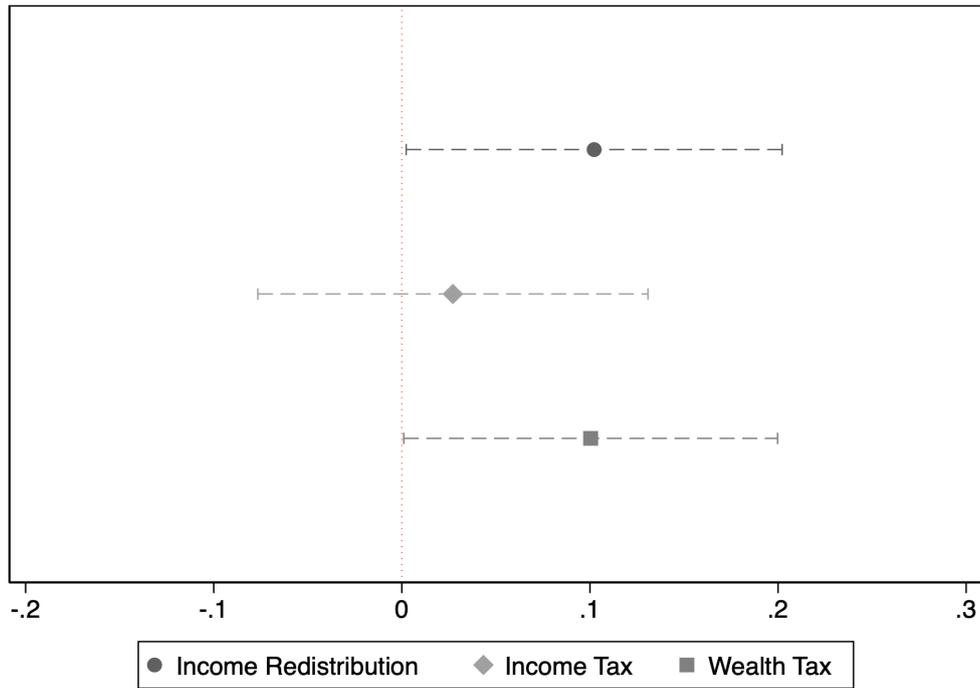


Figure 2: Priming Effects of Rich vs Poor Treatment with 95% C.I.

and the lower end of the distribution. Recall that receiving the rich-households treatment coincides (though not perfectly) with having one's inequality perceptions being corrected downward. Receiving the poor-households treatment, on the other hand, coincides with learning that inequality is actually higher than previously thought.

The signs of the effects go in the expected direction, i.e. positive for the poor information treatment and negative when the information is given about the rich, but we can see that the effects are only significant at the conventional levels for the rich treatment. It is also worth noting that these effects have a similar, although slightly smaller, magnitude than the priming effects of 8.6% and 9.6% of a standard deviation for support for income redistribution and the introduction of a wealth tax, respectively.

Table 3: Treatment on the bottom 10%( $T_P$ ) versus treatment of the top 10%( $T_R$ )

	$ T_P  \leq  T_R $	$ T_P  =  T_R $	$ T_P  \geq  T_R $
Preference for Redistribution	Can not Reject	Can not Reject	Can not Reject
Income Tax	Can not Reject	Reject**	Reject***
Wealth Tax	Can not Reject	Reject**	Reject**

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Finally, we can see that the effect of the information treatment is mostly larger when it refers to the top of the distribution, as shown more formally by the results of the coefficient test presented in table 3. In summary, our results hint to a stronger reaction to the question and information about the rich

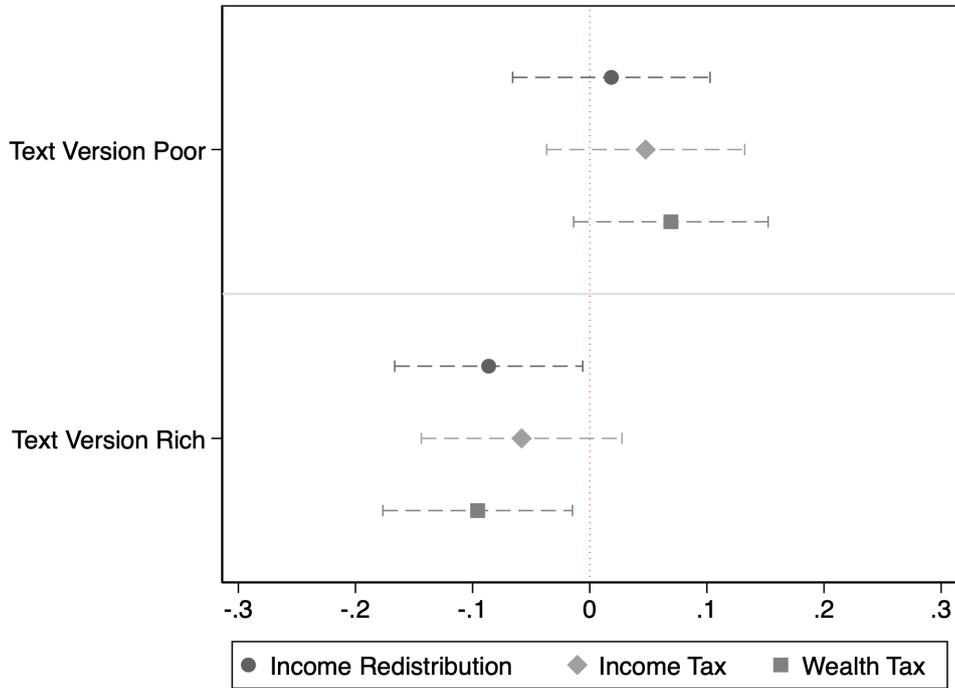


Figure 3: Marginal Effects of Information Treatment with 95% C.I.

than about the poor.

## 5.1 Robustness checks

**Different samples.** Using individuals' answers to their previous knowledge question we can construct a sample in which both treatments (Rich and Poor text version) affect the perception of inequality in the same direction, either increasing or decreasing those perceptions. As already mentioned, given the very small percentage of respondents who underestimate the share of the poor (ca. 20%) or of the rich (ca. 30%), the sample in column (1) is mostly formed by respondents receiving the poor text version, while the one in column (2) consists of respondents receiving the rich text treatment. In any case, in Table 4 we show that the results are consistent with the expectation and to complement the results presented above, we find significant impacts of the treatment when the information treatment is given to the sample where the information should decrease inequality perceptions.

**Alternative outcomes.** Our results are also robust to the use of alternative outcome definitions.<sup>15</sup> In column (1) and (2) of table 5, as an alternative for redistribution preferences, we look at the agreement with a statement that focuses on inequality in higher education and states that the state should provide

<sup>15</sup>For the description of these alternative outcomes refer to column (2) in tables A3, A4 and A5 in the Appendix.

Table 4: Average Effect by direction of the Treatment

	(1)	(2)
	Increase Inequality	Decrease Inequality
Income Redistribution	-0.016 (0.714)	-0.084* (0.073)
Income Tax	0.050 (0.270)	-0.050 (0.329)
Wealth Tax	0.066 (0.137)	-0.095** (0.047)

*p*-values in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

financial support for university students from low-income families. In column (3) and (4) we look at the support for an increase in income tax to decrease inequality at each respondents' own federal state, instead of the national level and finally in column (5) and (6) we use the support for another tax on wealth, the inheritance tax.<sup>16</sup>

Table 5: Average Treatment Effects

	(1)	(2)	(3)	(4)	(5)	(6)
	Redistribution (in education)		Income Tax (at the State level)		Inheritance tax	
Treated	0.049 (0.263)	0.026 (0.554)	0.056 (0.205)	0.053 (0.223)	0.114*** (0.008)	0.100** (0.015)
Text Version Rich	0.098* (0.058)	0.091* (0.075)	0.009 (0.860)	0.003 (0.954)	0.091* (0.077)	0.077 (0.125)
Treated × Text Version Rich	-0.133** (0.027)	-0.107* (0.072)	-0.103* (0.095)	-0.100 (0.101)	-0.160*** (0.008)	-0.145** (0.013)
controls	No	Yes	No	Yes	No	Yes
Observations	5,713	5,713	5,563	5,563	5,785	5,785

*p*-values in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

While there are no consistently significant results for the income tax at state level, our findings hold for attitudes towards redistribution in education and support for an inheritance tax. There is a significant priming effect in both cases. Turning to the effect of the information treatment, the coefficient signs go in the expected direction. In the case of redistribution attitudes the result is only significant for the rich treatment. Concerning the inheritance tax, however, we also find a significant effect for the poor treatment.

<sup>16</sup>The original question is on support for abolishing the inheritance tax, but we have re-coded it here as support for retaining the tax for ease of exposition.

## 6 Mechanism: changes in perceptions of inequality

In a next step we go on to investigate the mechanism, looking at one main way in which our treatment actually affects attitudes and preferences, which is via perceptions. From figure 4 we can see that respondents in Germany, for the most part, strongly agree with the statement that the income gaps in society are too big. However, we can also already see that, as for many of the variables analyzed before, we could have both a possible priming effect, due to mentioning either the top or the bottom of the distribution, and an information effect due to the treatment. Comparing the upper two panels, of those receiving the poor-households frame 45.6% strongly agree that income differences are too big, while of those receiving the rich-households frame 42.5% agree strongly. Once we focus on the panels on the left we can see that within the "poor" framing the treatment increase the likelihood of strongly agreeing with the statement by more than 3 percentage points, while, looking on the right on the "rich" framing, we see a decrease due to the treatment of almost 4.5 percentage points.

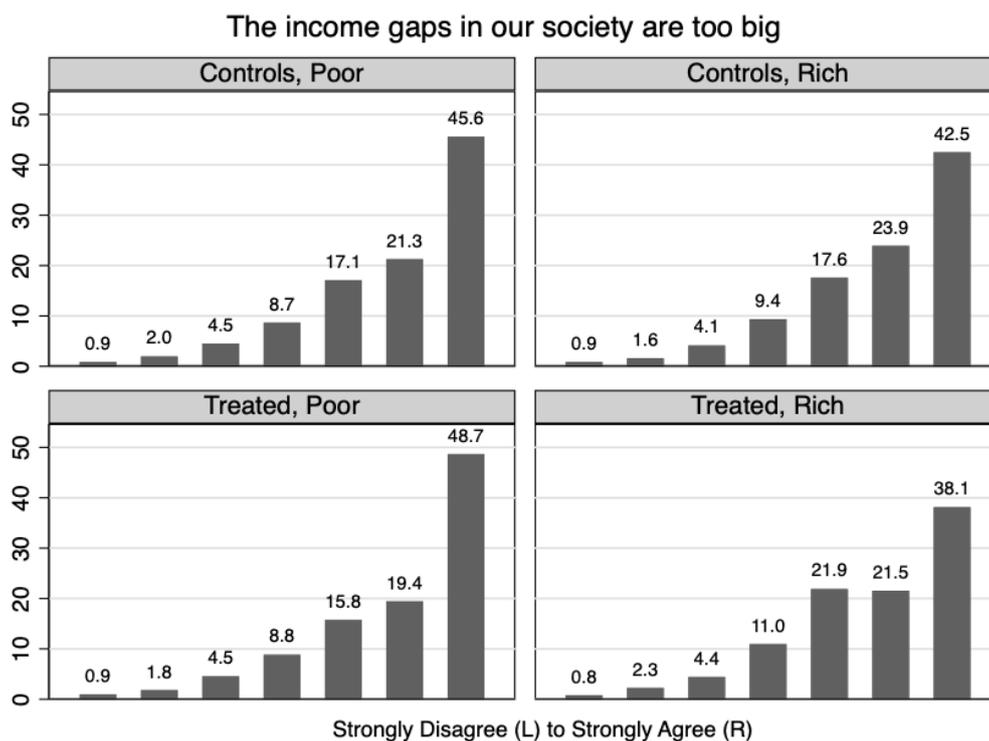


Figure 4: Histograms by text version and treatment status.

To see more formally if indeed our information treatments change people's perception of inequality, we estimate equation (3) without and with controls. Our results, presented in table 6 and figure 5, show that receiving the information treatment shifts the opinion that income gaps are too big.<sup>17</sup> Yet

<sup>17</sup>In this section unless stated otherwise we are using a consistent sample over all the outcomes so that the first stage

the average effect of the information treatment is only significant in the case of the rich-households treatment. Getting the information in this case decreases the perception of inequality of 18% of a standard deviation, 4.5% at the mean. One reason for why this may be the case is a potential ceiling effect for those who receive the poor-household treatment: they tend to learn that inequality is higher than they thought, but the perception that inequality is a problem is already very high, so for many respondents there is little room to shift this perception further. Anyhow the effects go in the expected direction: those who receive the treatment focusing on the rich, which for the bulk of the respondents means learning that the rich get a smaller share of the overall income than they thought, agree less strongly with the statement that the income differences in the society are too big, while those who receive the treatment focusing on the poor agree more strongly.

Table 6: First Stage

	(1)	(2)
	Perception of inequality	
Treated	0.061 (0.173)	0.065 (0.141)
Text Version Rich	0.022 (0.682)	0.038 (0.470)
Treated × Text Version Rich	-0.232*** (0.000)	-0.248*** (0.000)
controls	No	Yes
Observations	5,274	5,274
F-test	15.36	16.23

*p*-values in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

In table 7 columns (1), (3) and (5) show the association between the agreement on the statement that income differences are too big and general and specific policy preferences. For all our outcomes the coefficient sign goes in the expected direction (positive for interventionist policies) and the results are highly significant. People appear to state their attitudes in a way consistent with their inequality perception. Beyond this, little can be inferred from these results, since these are mere associations, causal mechanisms are likely to be at work in both directions and a range of confounders may be involved. For example, it seems probable to think that respondents who have a more egalitarian view could both be more likely to perceive the gaps in income to be too high and at the same time also be more supportive of state intervention and redistributive tax policies. Therefore in the following we focus on the results from our IV estimation in column (2), (4) and (6). Looking first at the effect on

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results apply to all our IV estimates.

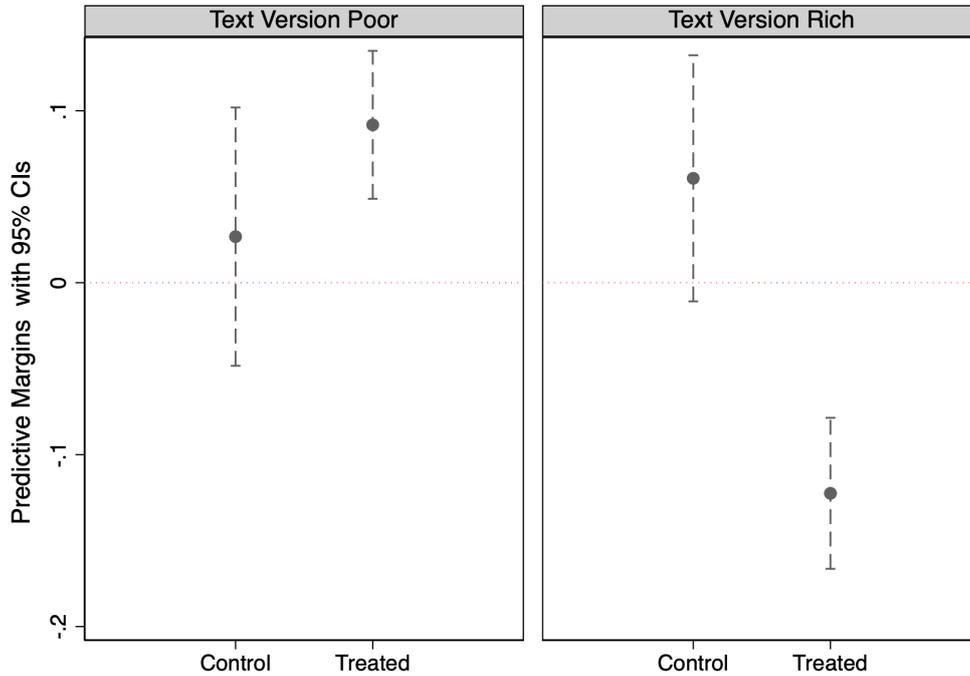


Figure 5: Predictive margin of the information treatment on inequality perception

preferences concerning the general role of the state in redistributing income, column (1) shows that there is no significant effect. This indicates that the compliers, those people who actually shift their perception of income inequality, do not shift their general preferences for redistribution.

Table 7: Effect of Inequality Perception

	Income Redistribution		Income Tax		Wealth Tax	
	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV
Perception of Inequality	0.400*** (0.000)	0.072 (0.603)	0.130*** (0.000)	0.322** (0.028)	0.207*** (0.000)	0.277** (0.049)
Observations	5,274	5,274	5,274	5,274	5,274	5,274

*p*-values in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

While when looking into support for specific policies, such as higher income tax and the introduction of a wealth tax, we do find a local treatment effect of a similar magnitude. The results show that a standard deviation increase in the perception of income inequality, increases their support for the income and wealth tax by around 30% of a standard deviation, 15% and 10% at the mean, respectively. As discussed above, the first stage results are driven by the rich-households treatment. This implies for the results of the IV that where perceptions are shifted, which in turn effects policy support, the driving force behind this is a decreased perception of inequality, leading to lower support for interventionist,

redistributive policies. Moreover, note that our IV estimates are always, when significant, larger than the OLS ones. This implies a possible downward bias and suggests that people who are indeed changing their opinion over the relevance of income inequality in their society, due to the information, may have a stronger link between their perceptions of the society and their tax preferences than the average individual.

## **6.1 Robustness checks**

### **6.1.1 Weak Instrument**

In this section we check the robustness of our results to the possibility of having weak instruments. As we know, in the case of strong instruments two-stage-least-squares (2SLS) are asymptotically unbiased. However, for weak instruments this is not the case. Weak instruments can bias point estimates and cause substantial distortions (Staiger and Stock, 1997). The first-stage F-statistic for testing the hypothesis that the instruments are unrelated to the endogenous regressor is a standard measure of the strength of the instrument. As can be seen from the bottom of table 6, our F-statistics range from 15.4 to 16.3, always above the standard rule-of-thumb threshold of 10. We further perform the robust weak instrument test developed by Montiel Olea and Pflueger (2013), that calculates effective F-statistics and critical values for the null hypothesis that the bias due to potentially weak instruments exceeds 5-10% of the "worst-case" benchmark bias. As we can see from table 8, in our case we can reject the null hypothesis of weak instruments.<sup>18</sup> Anyhow, as it is known that the limited information maximum likelihood (LIML) estimators have better small sample properties than 2SLS with weak instruments, in table 9 we also show the results of estimating our model using Limited Information Maximum Likelihood (LIML) and Generalized Method of Moments (GMM). Our results are barely affected by the chosen estimation method, which is in line with the results of the test above and reassuring in terms of robustness to the weak instrument problem.

### **6.1.2 Exclusion restriction**

Our identification strategy is based on the assumption not only of the validity of our instruments, as shown above, but also on the exclusion restriction. This assumption requires that any effect of our

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<sup>18</sup>We used the STATA routine *weakivtest* for implementing this test.

Table 8: Robustness check: Montiel-Pflueger robust weak instrument test

Effective F statistic:	16.57	
Confidence level:	5%	
Critical Values:	2SLS	LIML
5% of Worst Case Bias	14.001	13.588
10% of Worst Case Bias	8.950	8.723
20% of Worst Case Bias	6.144	6.016
30% of Worst Case Bias	5.109	5.018

Table 9: Robustness check: different estimation methods

	(1)	(2)	(3)
	Income Redistribution	Income Tax	Wealth Tax
LIML	0.046 (0.758)	0.324** (0.028)	0.281* (0.060)
GMM	0.074 (0.590)	0.322** (0.028)	0.279** (0.048)

*p*-values in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

proposed instruments, i.e. the randomly assigned treatments, on the outcome runs exclusively through its potential effect on inequality perception. This assumption is not verifiable. Yet we have reason to believe that it holds. One main suspicion about how the information could influence outcomes through other channels than the perception that inequality is too high, is via informing respondents about their personal expected gain or loss through being net contributors or benefactors of taxes and transfers. However, we think this is unlikely to be the case. Firstly, the information provided does not include any aspect on who would bear the tax burden or similar points. Further, since we provide information on the top and the bottom of the distribution only and since most people think of themselves as being rather towards the middle, it is unlikely that they infer a potential tax burden on themselves.

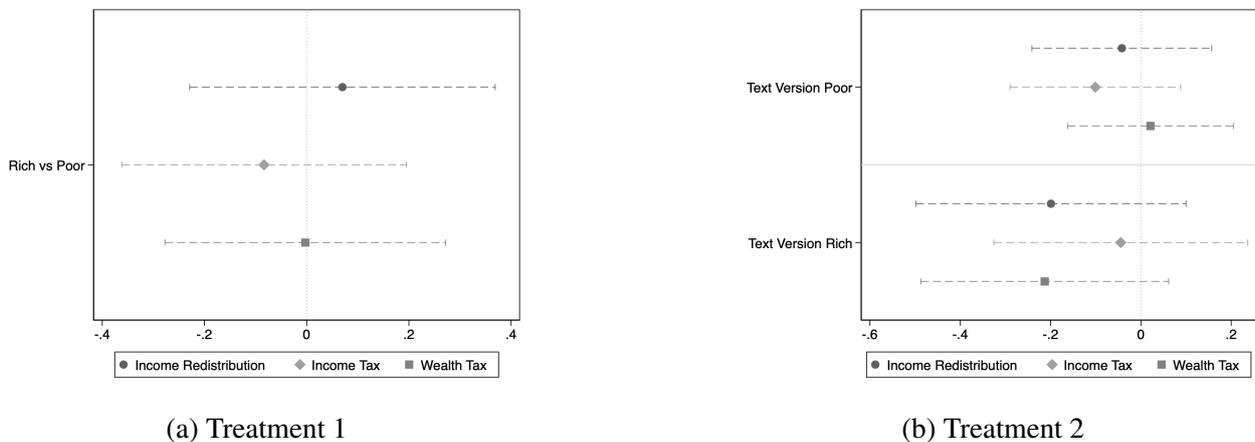


Figure 6: Placebo test: exclusion restriction

Moreover, in order to provide some supporting evidence on our assumption, we perform a placebo estimation on the group of respondents for which the treatments should not be affecting inequality perception, as they are (basically) correct on their guess. Reassuringly, as shown in figure 6, the effects of the treatments on our outcomes of interests are not significantly different from zero, which supports our identification strategy.

## **7 Concluding Remarks**

Three main results emerge from our analysis: Firstly, priming people to focus either on the bottom or the top of the income distribution has an effect. Those who receive the framing focusing on the rich are more likely to support general redistribution as well as specific redistributive policies.

Secondly, people appear to be more responsive to information about the richest 10 households than about the lowest: policy support shifts more in response to this information compared to information about the bottom of the distribution. We are aware that one reason for this may be that those who receive information on the upper end of the distribution are the respondents more likely to learn that inequality is lower than they thought. Because most people already perceive relatively high inequality, there may be a ceiling effect for information treatments that correct inequality upward, which applies predominantly to those receiving the poor-households treatment. But we also provide evidence that individuals' reaction to the information is stronger when it decreases the perception of inequality compared to increasing it.

Thirdly, considering the mechanisms via which information affects attitudes and preferences, we find that one channel is perceptions. Information shifts the perception of inequality, which in turn affects policy preferences. However, we find this only for the case of specific policy support. In the case of general redistribution attitudes, there does not appear to be an effect of information via perceptions of inequality.

Our findings help explain why previous results have been mixed and ambiguous. Our analysis indicates that what information about inequality is given, specifically whether information on the lower or the upper end of the distribution is provided, matters. Moreover, simply pointing peoples attention to the top or bottom of the income distribution has an effect as well. Our analysis further shows that the causal effect of information via perceptions differs depending on whether support for specific policies

or more general attitudes are looked at.

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## A Other Tables and Graphs

Table A1: Values of the treatments

	Bottom 10%	Top 10%
European Union	2.8	24
Germany	2.5	25
Baden-Wuerttemberg	2.3	24
Bavaria	2.5	24
Berlin	2.8	25
Brandenburg	2.5	23
Bremen	2.4	26
Hamburg	2.2	27
Hesse	1.9	29
Mecklenburg-West Pomerania	2.8	25
Lower Saxony	2.6	24
North Rhine-Westphalia	2.4	25
Rhineland-Palatinate	2.5	23
Saarland	2.5	25
Saxony	3.0	22
Saxony-Anhalt	2.8	24
Schleswig-Holstein	2.5	24
Thuringia	2.6	23

Sources: Eurostat and author's calculation based on SOEP data for the year 2018, the last available year at the time of the survey.

Table A2: Average overestimates by treatment

	Bottom 10%	Top 10%	Difference
Control	16.3	28.1	-11.8***
Treated	15.8	26.9	-11.1***
Difference	0.5	1.2	

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A3: Answer frequencies role of government questions

	(1)	(2)
Answer	Preference for redistribution %	Education Equality %
Complete disagreement	5.09	1.74
Partial disagreement	18.11	6.42
Partial agreement	39.00	39.26
Complete agreement	37.81	52.58

Table A4: Willingness to pay higher income taxes to reduce inequality

Answer	(1)	(2)
	In Germany %	In the federal state %
No	36.37	34.88
Tendency towards no	32.86	32.29
Tendency towards yes	23.99	24.88
Yes	6.77	7.94

Table A5: Attitudes towards wealth tax

Answer	(1)	(2)
	Introducing a wealth tax %	Abolishing the inheritance tax %
Completely against	26.18	15.61
Somewhat against	19.52	20.05
Indifferent	22.02	27.04
Somewhat in favor	20.87	18.84
Completely in favor	11.42	18.47

Note: in the analysis in the text we inverted the answer ordering for the inheritance tax, looking at support for retaining the tax.

Table A6: Descriptive statistics by treatment group

	Control	Treated	Difference
Correct - my father was born in Germany	0.98	0.96	0.02
Correct - my mother was born in Germany	0.94	0.94	0.00
Correct - I was born in Germany	0.98	0.98	0.00
Children below the age of 18 in the household	78.09	78.96	-0.87
How many people (including yourself) live in your household? Number of people	2.22	2.25	-0.03
soz1==male	0.47	0.49	-0.01
soz1==female	0.52	0.51	0.02
soz1==diverse	0.00	0.00	-0.00
soz2gr3==age group 18-39	0.29	0.31	-0.02
soz2gr3==age group 40-59	0.37	0.35	0.02
soz2gr3==age group 60 +	0.34	0.34	-0.00
soz5gr3==lower education	0.37	0.35	0.02
soz5gr3==medium education	0.31	0.30	0.01
soz5gr3==higher education	0.32	0.35	-0.03
soz3==Baden-Wuerttemberg	0.12	0.12	0.00
soz3==Bavaria	0.16	0.14	0.02
soz3==Berlin	0.03	0.05	-0.02*
soz3==Brandenburg	0.03	0.03	0.00
soz3==Bremen	0.01	0.01	-0.00
soz3==Hamburg	0.02	0.02	0.00
soz3==Hesse	0.09	0.09	-0.00
soz3==Mecklenburg-West Pomerania	0.02	0.02	0.00
soz3==Lower Saxony	0.09	0.09	-0.00
soz3==North Rhine-Westphalia	0.23	0.22	0.01
soz3==Rhineland-Palatinate	0.05	0.06	-0.01
soz3==Saarland	0.02	0.01	0.00
soz3==Saxony	0.05	0.06	-0.01
soz3==Saxony-Anhalt	0.03	0.03	0.00
soz3==Schleswig-Holstein	0.03	0.03	0.00
soz3==Thuringia	0.03	0.03	-0.00
soz8==working full time with more than 30 hours per week	0.46	0.46	-0.00
soz8==working part time in your main occupation	0.12	0.10	0.02*
soz8==marginal employment with less than 10 hours per week	0.02	0.03	-0.00
soz8==on temporary leave or furlough	0.01	0.01	0.00
soz8==retired	0.28	0.28	-0.00
soz8==occupied with domestic or care work	0.03	0.03	0.00
soz8==permanently unable to work due to sickness or disability	0.02	0.02	-0.00
soz8==unemployed, looking for employment	0.02	0.03	-0.00
soz8==unemployed, not looking for employment	0.01	0.02	-0.01*
soz8==other	0.03	0.04	-0.00
md_0010==unmarried / single	0.20	0.18	0.01
md_0010==married	0.48	0.48	0.00
md_0010==unmarried / in a relationship	0.19	0.21	-0.02
md_0010==divorced	0.07	0.07	-0.01
md_0010==widowed	0.05	0.05	0.00
md_0010==in a civil union	0.01	0.01	0.00
md_0010==no answer	0.01	0.01	0.00
md_0790==yes, full time	0.43	0.45	-0.01
md_0790==yes, part time	0.16	0.13	0.02*
md_0790==other type of employment	0.04	0.03	0.00
md_0790==househusband/housewife	0.02	0.03	-0.01
md_0790==retired	0.27	0.27	0.00
md_0790==on parental leave	0.01	0.01	0.00
md_0790==unemployed	0.05	0.05	-0.00
md_0790==in education	0.02	0.02	-0.00
hhinc==below 1.140 euro net	0.10	0.11	-0.00
hhinc==from 1.140 euro to below 1.560 Euro net	0.10	0.10	0.00
hhinc==from 1.560 euro to below 1.950 euro net	0.08	0.09	-0.01
hhinc==from 1.950 euro to below 2.330 euro net	0.11	0.11	0.01
hhinc==from 2.330 euro to below 2.740 euro net	0.09	0.10	-0.00
hhinc==from 2.740 euro to below 3.200 euro net	0.10	0.09	0.01
hhinc==from 3.200 euro to below 3.750 euro net	0.09	0.08	0.01
hhinc==from 3.750 euro to below 4.470 euro net	0.07	0.08	-0.01
hhinc==from 4.470 euro to below 5.670 euro net	0.09	0.08	0.01
hhinc==5.670 euro or more	0.06	0.06	0.00
hhinc==No answer	0.11	0.11	-0.00

Table A7: Descriptive statistics by text version

	Bottom	Top	Difference
Correct - my father was born in Germany	0.96	0.97	-0.01
Correct - my mother was born in Germany	0.94	0.94	-0.00
Correct - I was born in Germany	0.97	0.98	-0.01
Children below the age of 18 in the household	78.14	79.34	-1.20
How many people (including yourself) live in your household? Number of people	2.25	2.23	0.01
soz1==male	0.48	0.49	-0.02
soz1==female	0.52	0.50	0.02
soz1==diverse	0.00	0.00	-0.00
soz2gr3==age group 18-39	0.31	0.30	0.01
soz2gr3==age group 40-59	0.34	0.37	-0.02
soz2gr3==age group 60+	0.35	0.33	0.01
soz5gr3==lower education	0.35	0.35	-0.00
soz5gr3==medium education	0.31	0.31	0.00
soz5gr3==higher education	0.34	0.34	0.00
soz3==Baden-Wuerttemberg	0.13	0.12	0.00
soz3==Bavaria	0.14	0.15	-0.01
soz3==Berlin	0.05	0.04	0.01**
soz3==Brandenburg	0.03	0.03	0.00
soz3==Bremen	0.01	0.01	-0.00
soz3==Hamburg	0.02	0.02	-0.01*
soz3==Hesse	0.08	0.09	-0.01
soz3==Mecklenburg-West Pomerania	0.02	0.01	0.01
soz3==Lower Saxony	0.08	0.09	-0.01
soz3==North Rhine-Westphalia	0.23	0.22	0.01
soz3==Rhineland-Palatinate	0.06	0.05	0.01
soz3==Saarland	0.01	0.01	0.00
soz3==Saxony	0.06	0.06	0.00
soz3==Saxony-Anhalt	0.03	0.03	-0.00
soz3==Schleswig-Holstein	0.03	0.03	-0.00
soz3==Thuringia	0.03	0.03	0.00
soz8==working full time with more than 30 hours per week	0.44	0.47	-0.03*
soz8==working part time in your main occupation	0.11	0.11	-0.00
soz8==marginal employment with less than 10 hours per week	0.02	0.03	-0.00
soz8==on temporary leave or furlough	0.01	0.01	-0.00
soz8==retired	0.28	0.27	0.01
soz8==occupied with domestic or care work	0.02	0.03	-0.00
soz8==permanently unable to work due to sickness or disability	0.02	0.02	0.00
soz8==unemployed, looking for employment	0.03	0.02	0.01
soz8==unemployed, not looking for employment	0.02	0.01	0.00
soz8==other	0.04	0.03	0.01
md_0010==unmarried / single	0.18	0.19	-0.01
md_0010==married	0.48	0.47	0.01
md_0010==unmarried / in a relationship	0.20	0.20	0.00
md_0010==divorced	0.08	0.07	0.01
md_0010==widowed	0.05	0.05	-0.00
md_0010==in a civil union	0.01	0.01	0.00
md_0010==no answer	0.01	0.01	-0.00
md_0790==yes, full time	0.43	0.45	-0.02
md_0790==yes, part time	0.13	0.15	-0.02
md_0790==other type of employment	0.04	0.03	0.00
md_0790==househusband/housewife	0.03	0.03	-0.00
md_0790==retired	0.28	0.26	0.01
md_0790==on parental leave	0.01	0.01	0.00
md_0790==unemployed	0.06	0.05	0.02**
md_0790==in education	0.02	0.02	-0.00
hhinc==below 1.140 euro net	0.11	0.10	0.00
hhinc==from 1.140 euro to below 1.560 Euro net	0.09	0.11	-0.01
hhinc==from 1.560 euro to below 1.950 euro net	0.08	0.08	-0.00
hhinc==from 1.950 euro to below 2.330 euro net	0.11	0.11	0.00
hhinc==from 2.330 euro to below 2.740 euro net	0.10	0.09	0.00
hhinc==from 2.740 euro to below 3.200 euro net	0.10	0.10	0.00
hhinc==from 3.200 euro to below 3.750 euro net	0.08	0.08	-0.00
hhinc==from 3.750 euro to below 4.470 euro net	0.09	0.07	0.01
hhinc==from 4.470 euro to below 5.670 euro net	0.08	0.08	0.00
hhinc==5.670 euro or more	0.06	0.06	-0.00
hhinc==No answer	0.11	0.11	0.00