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# Perceived Income Positions and Attitudes towards EU Inequality

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# **Perceived Income Positions and Attitudes towards EU Inequality**

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### **Abstract**

We examine the relationship between perceived income positions and attitudes towards inequality at a supranational-level. Conducting a survey in four EU Member States (Germany, Italy, Poland, and Sweden), we confirm that their citizens misperceive their own income position in the EU. Once we account for these misperceptions, we find that those with a lower income rank assess EU income differences as more unjust and are more supportive of an EU minimum wage. When we inform a randomized subsample about their actual income position in the EU, those who learn to be richer than they initially thought assess EU income differences as less unjust. Respondents in Italy, Poland, and to a lesser extent Sweden drive these results whereas income misperceptions of German respondents have opposing effects.

**Keywords:** Income, Misperceptions, Inequality, EU Minimum Wage, European Union, Survey Experiment

**JEL classification:** D31, D63, F55

## 1 Introduction

To this day, large economic differences persist between the citizens of the European Union. The EU addresses these differences with redistribution instruments such as the Cohesion Fund, which supports relatively poor Member States through investments in e.g. their infrastructure or environment. While there is broad agreement at the political level to promote greater convergence between Member States, we know little about how their citizens assess the inequalities between them. How does a Swedish citizen, living in a relatively rich country, perceive and assess EU inequality compared to a Polish citizen, who lives in a relatively poor country? Are they either in favor of or against the introduction of an EU minimum wage - a policy measure that could reduce income differences between EU citizens?

Theoretical models like the Meltzer-Richard model predict a negative association of income and redistributive preferences. More recent empirical research on the national level shows that many individuals substantially misperceive their income position within their country (e.g. Bublitz, 2022; Cruces et al., 2013; Engelhardt and Wagener, 2018; Karadja et al., 2017). Building on these studies, we test if relative income positions also underlie the formation of attitudes towards inequality and redistribution in a greater entity like the EU. We address two main questions: How do EU citizens' relative income positions relate to their attitudes towards EU inequality? Does informing EU citizens about their actual income position in the EU change these attitudes?

We collected data from the four EU Member States Germany, Italy, Poland, and Sweden in March 2020. In an online survey, respondents reported their income, their perceptions of their own national and EU income positions, as well as their EU identity and standard socio-demographics. A core feature of the survey is a randomized experiment that informed a subsample of respondents in each country about their actual income position within the EU. After the treatment, all respondents were asked to assess income differences in their country as well as in the EU and to state whether they are in favor of or against the introduction of an EU minimum wage.

We obtain three main findings for the cross-country sample: *First*, richer citizens tend to place themselves lower and poorer respondents higher in the EU income distribution. Once we control for these misperceptions, we find a significant negative association between citizens' relative income rank and their attitudes. In particular, respondents who rank lower within the EU regard EU income differences as more unjust and are more supportive of an EU minimum wage than respondents who hold a higher rank. *Second*, income misperceptions in the EU also associate directly with their inequality attitudes: Respondents who overestimate (underestimate) their position regard EU income differences as less (more) unjust and show less (more) support for an EU minimum wage.

*Third*, our experiment reveals that respondents, who learn that they have a higher income position in the EU than they initially thought, tend to consider income differences in the EU as less of a problem. However, we do not obtain a treatment effect on the support for an EU minimum wage. This indicates that the information treatment did not affect respondents' preferences for the presented policy measure as it did for their general attitudes towards inequality.

Country-specific analyses reveal that respondents from Italy and Poland, and less so from Sweden, drive the effects of income misperceptions on attitudes towards EU inequality described above. In contrast, German respondents who overestimate (underestimate) their position regard EU income differences as more (less) unjust. In addition, they also consider income differences in the EU as less – instead of more – of a problem when they learn to be poorer. In the same vein, German respondents who learn that they stand lower (higher) in the EU are less (more) in favor of an EU minimum wage. Additional analyses reveal that these diverging findings cannot be explained by socio-demographics, cultural identity, or their political position. Thus, the robust difference in findings between the German sample and respondents from the other three countries suggests that no uniform mechanism exists for these Member States that relates attitudes towards EU inequality to income perceptions within the EU.

Our paper contributes to studies on interpersonal and cross-country comparisons within the EU. Delhey and Kohler (2006) and Lahusen and Kiess (2019), for instance, show that Europeans use foreign countries as a reference group and that cross-country comparisons affect their life satisfaction. Bublitz et al. (2022) find that EU citizens have a good understanding of where they stand within the EU and of the existing disparities across EU countries. Results of these studies therefore indicate that EU citizens compare themselves with their EU co-citizens. Our findings reveal that cross-national income comparisons also play a socio-political role; i.e. EU citizens form their attitudes towards EU inequality based on where they rank themselves relative to their co-citizens in other Member States.

We also contribute to the growing literature on income misperceptions by focusing for the first time on EU income misperceptions and their relation to attitudes towards EU inequality. To our knowledge, only Fehr et al. (2019) pursue a similar approach by testing whether informing respondents simultaneously about their national and global position affects their redistributive preferences. While they partly replicate findings from previous studies on the national level, the information treatment has no effect on preferences for global redistribution. In contrast, we focus on the EU, a lower but still supranational level, and a region for which established redistribution channels exist and with which EU citizens have a better picture and a closer relationship.

At the policy level, our paper strongly relates to recurring debates on EU social and labor market policies. The EU has recently agreed on a framework on adequate minimum wages in all Member States, seeking to increase the minimum wage protection for employed persons. Our paper contributes to this and future debates by analyzing to what extent EU citizens are in favor of an EU minimum wage that would go beyond the current legislation. Furthermore, we know little about how EU citizens assess relative income disparities within the EU. Our paper therefore gives important insights into how EU citizens actually think about European convergence via reducing income inequalities across Member States.

Our paper proceeds as follows: Section 2 presents the theoretical background. Section 3 describes our data and descriptive statistics. Section 4 presents the results and Section 5 concludes.

## 2 How Relative Income Positions Shape Inequality Attitudes

### 2.1 Theoretical Background

Relative income positions play an important role in many economic models that predict attitudes towards income inequality. A prominent example is the Meltzer-Richard model (Meltzer and Richard, 1981), which assumes that individuals are in favor of redistribution and exhibit a stronger stance against income inequality when their income is lower than society's average income. In concrete, individuals only care about their personal consumption (where consumption equals income) and the tax scheme relies on lump-sum benefits, financed by a proportional income tax (Alesina and Giuliano, 2011; Iversen and Goplerud, 2018). As long as the budget is balanced and non-linear efficiency costs of taxation are involved, individual  $i$  obtains the following utility function  $U_i$  with a tax rate  $t$ , average income  $x_A$  and a wastage  $w$ :

$$U_i = c_i = (1 - t)x_i + x_A t - wt^2 \quad (1)$$

The first term  $(1 - t)x_i$  denotes the after-tax labor income,  $x_A t$  is the lump-sum transfer and  $wt^2$  denotes the efficiency costs of taxation (this notation stems from Alesina and Giuliano, 2011). Individual  $i$  chooses the optimal tax rate  $t^*$  by maximizing her consumption  $c_i$  with  $t^* = \frac{x_A - x_i}{2w}$ . Individual  $i$  is in favor of a redistributive tax  $t^*$ , if her income is lower than average (given that the efficiency costs are not too large). Consequently, as long as  $(x_A - x_i) > 0$ , individual  $i$  will prefer less inequality, since through redistribution she will increase her consumption. In contrast, for respondents with income  $x_i$ , such that  $(x_A - x_i) < 0$ , a reduction of inequality will make them worse off, since their income will be reduced.

The Relative Deprivation model (Clark and D'Ambrosio, 2015), in turn, predicts that individuals compare themselves with all of their co-citizens in society (not only 'the average') and feel the more deprived, the lower their income is relative to that of their co-citizens who are doing better. Following Yitzhaki (1979) and Hey and Lambert (1980), Clark and D'Ambrosio define relative deprivation as the sum of the differences between individual  $i$ 's income  $x_i$  and the incomes  $x_j$  of all individuals who are better off than  $i$  ( $x_j > x_i$ , where  $j \in B_i(x)$ ), divided by the number of individuals  $n$  in society:

$$D_i(x) = \sum_{j \in B_i(x)} \frac{x_j - x_i}{n} \quad (2)$$

The higher  $D_i(x)$ , the more deprived individual  $i$  is due to inequality in society. The key element of the Relative Deprivation model is that individuals dislike inequality to different extents, depending on where they stand in the income distribution: individuals with a lower income position will regard inequality as more unjust and will be more in favor of redistribution compared to individuals with a higher income position.

In contrast to the first two models, the Fehr-Schmidt model (Fehr and Schmidt, 1999) assumes that all individuals prefer equitable over non-equitable outcomes, independent of where they stand in society. However, they evaluate these inequalities differently, depending on whether inequality is advantageous or disadvantageous for them. In the two-player scenario, individual  $i$ 's utility function includes her income  $x_i$  and the utility loss from inequality:

$$U_i = x_i - \alpha_i \max[x_j - x_i, 0] - \beta_i \max[x_i - x_j, 0], i \neq j, \quad (3)$$

where  $\alpha_i \max[x_j - x_i, 0]$  is the utility loss from disadvantageous inequality (where  $x_i < x_j$ ) and  $\beta_i \max[x_i - x_j, 0]$  denotes the utility loss from advantageous inequality (where  $x_i > x_j$ ). Fehr and Schmidt assume that  $\alpha_i > \beta_i$  (where  $0 \leq \beta_i < 1$ ), so that individual  $i$  suffers more from disadvantageous than from advantageous inequality. Therefore, the Fehr-Schmidt model predicts that inequality always causes a utility loss, but this loss is even greater if inequality is to their own material disadvantage.

All three models (Meltzer-Richard, Relative Deprivation, and Fehr-Schmidt) have in common that they predict a negative association between income and inequality attitudes, though with different focuses. Figure 1 depicts their theoretical predictions graphically. The black curve with a solid line shows a typically right-skewed actual income distribution of individual  $i$ 's society with the average income  $\mu$  of this distribution, individual  $i$ 's income  $x_i$ , and another individual  $j$ 's income  $x_j$ . In this scenario, individual  $i$  will prefer less inequality, since she has a lower than average income (Meltzer-

Richard model), she will feel relatively deprived to all co-citizens in society who have an income  $x_j$  that is higher than  $x_i$  (Relative Deprivation model), and she will regard inequality between her and an individual  $j$  particularly disadvantageous (Fehr-Schmidt model), since  $x_i < x_j$ .

[place Figure 1 about here]

Empirical studies have found indicative evidence for a negative association between income and redistributive preferences and generally confirm the prediction of the models (e.g., Alesina and La Ferrara, 2005; Bernasconi, 2006; Alesina and Giuliano, 2011; Rehm, 2011; Franko et al., 2013; Henninghausen and Heinemann, 2014; Brown-Iannuzzi et al., 2015; Beramendi and Rehm, 2016; Stiers et al., 2022). However, all three models rely on the strong assumption that individuals have sufficient knowledge about the income distribution in their society in order to form their preferences towards it. Recent literature has questioned this assumption and has shown that a majority of individuals misperceive their income position in their own country. In a pioneer study in the greater region of Buenos Aires (Argentina), Cruces et al. (2013) find that lower-income individuals tend to overestimate their position and higher-income individuals tend to underestimate it. This pattern has been confirmed for many other countries, such as Sweden (Karadja et al., 2017), Denmark (Hvidberg et al., 2020), Germany (Engelhardt and Wagener, 2018), France, Russia, or Brazil (Bublitz, 2022).

Due to these misperceptions, an individual's perceived income position might associate more strongly with her attitudes towards inequality than her actual position. For instance, individual  $i$  may perceive an income distribution in her country that is to the right of the actual income distribution as depicted by the grey curve in Figure 1. This perceived income distribution has a higher mean (the average income  $\mu$  of the perceived distribution in grey) than the mean of the actual distribution. In this case, individual  $i$  will perceive a larger gap between her own income and the average. She will also estimate a lower own income position than she actually has, feeling more relatively deprived to all with a higher income and more disadvantaged relative to an individual  $j$  than she actually is. Because of these misperceptions, individual  $i$  will regard inequality as even more unjust than in the scenario where she perceives the income distribution and her own income position correctly (black curve in Figure 1).

Most of the literature on income misperceptions has conducted survey experiments to analyze the effect of informing respondents about their misperception on their attitudes towards inequality. In a



meta-analysis, Ciani et al. (2021) show that individuals adapt their redistributive preferences after the information treatment in line with traditional theory: Individuals who learn that they rank lower in the income distribution than they initially thought (that is, who overestimated their position) tend to show more support for redistribution, while those who learn that they initially underestimated their position tend to show less support. However, the obtained effects are often small and heterogeneous across studies.

There also exist a few studies that directly measure how misperceptions affect the association between personal income and inequality attitudes. With a survey conducted in Spain, Fernández-Albertos and Kuo (2018) find that both actual and perceived income positions negatively associate with preferences for redistribution, though the association is less robust for the actual position. In contrast, Weisstanner and Armingeon (2022) show for a sample in Switzerland that the actual income position has more predictive power for inequality attitudes than the perceived one. This deviating finding for Switzerland in turn suggests country-specific differences in the underlying mechanisms for the formation of inequality attitudes.

Taking the discussed literature on relative income (misperceptions) and inequality attitudes as our starting point, we analyze in this paper to which extent individuals' income positions and their respective misperceptions relate to their attitudes towards income inequality within the EU. Guided by the models' theoretical prediction of a negative association between income and inequality attitudes, we investigate if individuals who rank lower (higher) in the EU income distribution regard inequality within the EU as more (less) unjust and are more (less) in favor of social policy reforms that target this inequality, in particular, the introduction of an EU minimum wage. Furthermore, we ask to what extent income misperceptions drive the attitudes. We expect that informing individuals about their misperceptions changes their attitudes towards EU inequality. That is, individuals should assess EU inequality as more (less) unjust and be more (less) in favor of an EU minimum wage when learning that they rank lower (higher) than initially thought.

## **2.2 Country Differences**

The EU promotes upwards convergence for its Member States because important economic differences persist between them. These can be exemplified with the countries Germany, Italy, Sweden, and Poland, a sample with large cross-country income differences. Compared to the EU average, the median equivalized net household income is higher in Germany and Sweden, much

lower in Poland, and is close to the EU average for Italy.<sup>1</sup> These differences, in turn, may lead to cross-country variation in aggregated income perceptions and their attitudes towards inequality at the EU level. If individuals compare themselves also at a supra-national level, the theoretical models (presented in the previous section 2.1) suggest that Polish and Italian citizens should (a) rank themselves lower in the EU income distribution, (b) regard EU income differences as more unjust, and (c) be more in favor of an EU minimum wage than those living in the economically richer Member States Germany and Sweden.

The countries also differ on the level and the legal framework for a minimum wage. A statutory minimum wage was newly introduced in 2015 in Germany, after a steady decrease in employees' coverage by collective wage bargaining. The German minimum wage is above the average level of minimum wages in different EU Member States. Poland, in turn, has a long tradition of minimum wage setting that already dates back to the mid-1950s, and its current level is way below the EU average. In contrast, Sweden and Italy belong to the small group of EU Member States that have not yet introduced a statutory minimum wage. Wage setting relies on collective bargaining, with which wages reach a very high level in Sweden, way above the EU average and highest in our country sample. Therefore, Swedish citizens may be least in favor of a minimum wage at the EU level compared to respondents in the other three countries, since they could hardly benefit from it or may have to pay for potential wage increases in other countries. In Italy and Poland, wages are comparatively lower and their citizens might therefore be more supportive of an EU minimum wage. The existence of a minimum wage in Germany should render its citizens more skeptical towards an EU minimum wage than their Polish and Italian counterparts, but less so than citizens in Sweden, where wages are significantly higher.

### **3 Data**

#### ***3.1 Survey Characteristics***

Our data were collected within the research project “Socioeconomic Analyses of perceptions of (re-)distribution in Europe (SOECBIAS)”. The project analyzes income (mis-)perceptions at the EU level and their consequences for preferences for EU social policies. Based on quota samples (groups defined by gender, age, education, and income), the survey was implemented and conducted by YouGov Deutschland in March 2020 in the four EU Member States Germany, Italy, Poland, and

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<sup>1</sup> For the population aged 18 and above, the median equivalized net household income (in Euro) in 2019 is 25,005 in Sweden, 23,699 in Germany, 17,554 in Italy, and 7,150 in Poland, while the average in EU-28 is 18,006 (Source: Eurostat, last update on December 17, 2021).

Sweden. To address small imbalances, we apply survey weights so that the sample is representative along the quotation characteristics. The data collection is described in Beblo et al. (2021).

In the survey, we started with questions about respondents' socio-political orientations, followed by detailed questions on their actual and perceived income positions. Respondents in all countries were first asked to state their yearly net household income, which we used to calculate their actual income positions (in percentiles) in their own country and in the EU, based on EU-SILC data. Afterwards, we asked them to estimate how many percent of their country's and the EU population had a total yearly net household income that was lower than theirs in 2019. Answers to these questions denote their perceived national and EU income position. We use both variables to calculate their income misperception by subtracting their actual from their perceived income position, in line with the operationalization of previous studies (e.g. Karadja et al., 2017).

Following a randomization procedure, one group of respondents then received information about their actual EU income position (treatment group, N= 2049, with 510 respondents in Germany, 501 in Italy, 522 in Poland, and 516 respondents in Sweden). Another group of respondents received no information (control group, N= 2071, with 511 respondents in Germany, 514 in Italy, 528 in Poland, and 518 respondents in Sweden). Figure A1 and A2 in the appendix depict screenshots of the treatment.

After the treatment, we asked all respondents whether they agree that income differences in their own country and within the EU are just. The answers range on a 5-point Likert scale from 1 ("agree strongly") to 5 ("disagree strongly"). For the empirical analysis, we reversed the values of both indicators. In addition, respondents needed to state if they would support the introduction of an EU minimum wage that would be adjusted to reflect the living costs in each EU Member State with answering categories ranging from 1 ("strongly against") to 5 ("strongly in favor"). In the regression analyses, all dependent variables are standardized to z-scores (with a mean of zero and a standard deviation of one) for better interpretation. The survey concluded with further questions on socio-demographics.

Apart from standard sociodemographic characteristics (age, gender, education, and employment status), we control in our regression models for EU identity (respondent identifies first or only as EU citizens). As our data collection was carried out during the first wave of the COVID-19 pandemic, we also include a variable about individual COVID-19 affectedness (asking whether respondents or anyone in their close surroundings was infected with the virus) to control for potential consequences of the pandemic on policy preferences. Summary statistics of the covariates are provided in Table A1 in the appendix. In each country, we find evidence for almost perfect

randomization between treatment and control group. The only exceptions are a five-percentage points smaller number of German respondents in the treatment group who indicate that their surrounding was affected by COVID-19 (13% in the control group) and a two-percentage points smaller number of Swedish respondents in the treatment group who have an EU identity (19% in the control group) (see Table A1 in the appendix). We account for these negligible imbalances with control variables in our regression analysis.

### 3.2 *Descriptive Statistics*

Table 1 shows descriptive statistics on respondents' attitudes towards income inequality. We concentrate here on the control group to obtain estimates that are representative of each country's population for the main variables of interest, since the estimates are not distorted by the treatment. On average, respondents are slightly more likely to agree that income differences in their own country are unjust, with a mean value of 3.58 over all countries. Compared to German and Polish respondents, Italians (mean value of 3.75) assess income differences in their country as most unjust. In contrast, Swedes (mean value: 3.35) assess national income differences as significantly less unjust than respondents in all other three countries.

[place Table 1 about here]

Taking all countries together, we find that attitudes towards EU income differences are, with a mean value of 3.56, quite similar to attitudes towards national income differences. Looking at the countries separately, respondents in Germany, Italy, and Sweden on average assess income differences in the EU as similarly unjust. However, and quite surprisingly, Polish respondents (mean value: 3.22) assess the differences in the EU as significantly less unjust than all other respondents, although Poland is the economically poorest country in the EU within our country sample and its citizens rank on average lowest in the EU income distribution. Further analyses in other similarly poor countries would be needed but this finding provides suggestive evidence that people living in poorer countries do not automatically assess inequality as more unjust than people in richer countries.

Over all countries, respondents show slight support for the introduction of an EU minimum wage, with a mean value of 3.59. We obtain cross-country differences, which are in line with our expectations: Polish and Italian respondents, who are to gain the most on average from its introduction (as discussed in Section 2.2), are the most in favor of an EU minimum wage, with a mean value of 3.77 for Poland and 3.75 for Italy respectively. The support in Germany (mean value:

3.60) is a bit lower, and it is significantly lower in Sweden (mean value: 3.29). As pointed out earlier, this may be reminiscent of the country specific history with minimum wages. Swedes have already a relatively high minimum wage and may be afraid that they would pay for wage increases in other countries.

Figure 2 illustrates respondents' perceived income positions as a function of their actual income position at national (left panel) and the EU level (right panel), including respondents from both the control and the treatment group. The left panel shows that, in accordance with previous studies on national income misperceptions, respondents have substantial national income misperceptions: For each country, those who stand at the bottom of the national income distribution tend to overestimate their income position (the curves are on the left side of the 45-degree dash line). In contrast, respondents who rank higher tend to underestimate their income position, that is, they perceive a lower than actual national income position. A comparison of the curves in the left and right panels reveal that income misperceptions are similarly high at EU and at national level. At the EU-level, the same pattern holds again for all four countries: Lower-income respondents overestimate and higher income respondents underestimate their EU income position.<sup>2</sup>

[place Figure 2 about here]

## 4 Findings

In this section, we analyze the relationship between relative income ranks, income misperceptions, and attitudes towards EU inequality. We define income misperceptions by subtracting the actual from the perceived income position. Thus, a value above zero indicates an overestimation and a value below zero an underestimation of one's own income position.

### 4.1 *Income positions and attitudes towards National and EU Inequality*

Using data from the control group, we first analyze how relative income positions associate with attitudes towards EU inequality. As a benchmark, we analyze relative income positions at national level and their relationship with attitudes towards national inequality. Column 1 of Table 2 in panel a) shows that respondents' actual national income position negatively associates with how unjust they assess the income differences in their country. Moving up 10 percentiles in the actual income

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<sup>2</sup> For further analyses of the formation of EU income misperceptions in the four countries, see Bublitz et al. (2022).

distribution makes respondents assess national income differences as less unjust by 0.03 standard deviations. However, this coefficient might be biased due to the substantial amount of misperception respondents have about their income position (see Figure 2 in section 3.2). In particular, as shown in Figure 2, higher-income individuals tend to underestimate their position and should therefore regard income differences as more unjust, as they mis-rank themselves too low in the income distribution. This leads to a downward-bias of the coefficient in model 1, since we leave out the effect that income misperceptions have on the association between actual income positions and respondents' attitudes. In model 2, we add the national income misperception to the model and find that the coefficient more than doubles in size, which confirms our reasoning.

[place Table 2 about here]

In a next step, we test if the negative relationship between respondents' income position and their attitudes also exists at the EU level. Results in column 3 and 5 reveal small negative and statistically insignificant associations between respondents' actual income position in the EU and their attitudes towards EU income differences as well as the introduction of an EU minimum wage. However, the association again might be biased towards zero by respondents' income misperceptions. In fact, adding EU income misperceptions to the model again more than doubles the size of the coefficients, as displayed in column 4 and 6 of panel a). We now find that respondents assess EU income differences as less unjust (significant at 10%-level) and support an EU minimum wage significantly less (at 5%-level) when they rank higher in the EU income distribution. Moreover, we also confirm that income misperceptions relate to respondents' attitudes directly. Moving up the misperceived rank by 10 percentiles makes respondents assess EU income differences as less unjust by 0.03 standard deviations and decreases respondents' support for an EU minimum wage by 0.04 standard deviations. This means that the more respondents overestimate (underestimate) their income position, the less (more) unjust they assess the income differences in the EU and the less (more) they support an EU minimum wage, confirming our expectation. The results are robust to including control variables, as revealed in panel b).

Figure 3 illustrates potential cross-country differences in the relationship between income misperceptions and the respective inequality attitudes. The left panel confirms for each country the negative association between the misperceived rank and attitudes towards national income differences that we found in Table 2 above. The middle and right panel, in turn, reveal cross-country differences in the association of income misperceptions with attitudes towards EU inequality.

Respondents in Italy and Poland estimate EU income differences as more unjust when they underestimate their position and less unjust when they overestimate their position. Additionally, the higher their misperceived rank, the less unjust they assess these differences. We find the same pattern for their support for an EU minimum wage. In Sweden, the negative association only holds for their support for an EU minimum wage, while there exists no association between their misperceived rank and their assessment of EU income differences.

[place Figure 3 about here]

For Germany, we find no association between income misperception and the support for an EU minimum wage. Interestingly, and in contrast to the other three countries, an opposite pattern emerges for Germans' assessment of EU income differences: They estimate EU income differences as less (more) unjust when they underestimate (overestimate) their position and the higher their misperceived rank, the more unjust they assess EU income differences. This finding indicates that there is no uniform pattern that relates income misperceptions to attitudes towards EU inequality across all countries. Figure A3 reveals that the positive association found in Germany does not rest on a different association between Germans' actual income position and their attitudes: In fact, in each country, actual income negatively associates with both their attitudes towards national as well as EU income inequality.

Findings so far reveal that individuals' relative income positions associate negatively with their attitudes towards inequality at both the national as well as EU level. This negative association holds, once we account for the substantial income misperceptions that individuals have. Income misperceptions also directly associate with respondents' attitudes: Respondents who underestimate (overestimate) their position in the income distribution regard national and EU income differences as more (less) unjust and are more (less) in favor of an EU minimum wage. Respondents in Italy, Poland, and, to a lesser extent, Sweden, drive the results. In contrast, for Germany we find zero association between misperceived rank and their support for an EU minimum wage but a positive association for their evaluation of EU income differences.

#### **4.2 Treatment Effects: Information about actual income position**

In a next step, we test whether informing respondents about their actual EU income position affects their attitudes towards EU inequality. As previously confirmed, we assume that the treatment affects respondents' attitudes differently, depending on whether they learn with the treatment to stand

higher or lower in the EU income distribution in contrast to what they initially estimated. Results in Table 3 therefore show the treatment effects for the group of respondents who underestimate their position and for those who overestimate their position, first across all countries and then for each country separately. Results for the complete sample in column 1 of panel a) show that respondents who learn to rank higher than they initially thought, regard EU income differences as less unjust by 0.1 standard deviations. This is in line with our previous findings of a negative association between income rank and attitudes towards EU inequality and confirms our theoretical predictions. Consistently, the coefficient of the treatment among respondents who overestimate their position is positive, although much smaller and imprecisely estimated.

Results in column 2-5 reveal that the effect is mostly driven, in line with findings in Figure 3, by respondents in Poland and Italy. The coefficients of the treatment for Sweden are close to zero. For Germany, the signs of the coefficients are reversed. In particular, German respondents who learn to be standing lower in the EU than they initially thought regard EU income differences as even less unjust.

Results of panel b) reveal no significant treatment effect on the support for an EU minimum wage when looking at all countries. However, and consistent with the deviating finding in panel a), German respondents who learn about a lower rank are also less supportive of an EU minimum wage and more supportive when they learn to rank higher.

[place Table 3 about here]

One explanation for the deviating finding in Germany might rest on a different mechanism of how income misperceptions are shaped compared to the other three countries. For this reason, we additionally take individual sociodemographic characteristics as well as cultural and political orientations (i.e., EU identity, altruism, trust in the EU, and political left-right leaning) into account to test how these factors relate to income misperceptions and inequality attitudes in the respective countries. For Germany, the results of Table A2 reveal that the probability of overestimating one's EU income position are significantly lower among unemployed, female, and respondents with a higher actual income position. However, we find no systematic differences between Germany and the other three countries regarding how these factors predict the probability to overestimate one's income position. Furthermore, none of the factors relate to the attitudes towards EU inequality in differing way that it could explain the deviating findings for Germany.



Our findings provide strong evidence that in Germany income misperceptions play a different role at the national and the EU level: Respondents who underestimate (overestimate) their rank regard national income differences as more (less) unjust but EU income differences as less (more) unjust. In contrast, in Italy, Poland, and Sweden income misperceptions relate similarly to inequality attitudes at both national and EU level. In sum, with our data we can rule out potential reasons but we cannot provide a final explanation for the German case. What can, however, be safely concluded is that systematic uniform relationships between misperceptions and attitudes across countries are only partly existent.

## **5 Conclusion**

Our paper is the first to leave the national perspective in investigating how EU citizens' misperceptions of their own income positions in the EU relate to their attitudes towards EU income inequality. With a randomized online survey experiment conducted in the four EU Member States Germany, Italy, Poland, and Sweden, we test to which extent information about their actual income position changes these attitudes. This is of relevance because EU social policy measures are meant to address inequality beyond national borders and citizens may use broader reference frames to assess inequality. In addition, analyses of misperceptions beyond the national level can deepen our understanding of citizens' behavior and therefore corresponding theoretical concepts.

Our findings show that individuals' relative income positions negatively associate with their attitudes against inequality at both national and EU level, once we account for the substantial misperceptions they have of their own income rank. Furthermore, respondents who overestimate (underestimate) their own rank in the income distribution regard income differences in their own country and in the EU as less (more) unjust and show less (more) support for an EU minimum wage. Informing respondents about a higher income rank in the EU than they initially thought makes them assess EU income differences as less unjust. The effects are driven by Italy, Poland, and, to a lesser extent, Sweden. In Germany, in contrast, respondents' EU income misperceptions associate with their attitudes towards EU income inequality in a reversed way: German respondents who overestimate (underestimate) their own position in the EU income distribution regard EU income differences as more (less) unjust. Consistently, informing the German respondents that they stand lower (higher) than initially thought makes them regard EU income differences as less unjust and less (more) supportive of an EU minimum wage. The deviating findings for Germany do not rest on differences in socio-demographics or political or cultural identity.

We show that income misperceptions play a pivotal role for the formation of inequality attitudes at the supra-national level of the EU. At the same time, we do not obtain a uniform picture across all

four countries. This calls for caution in further research when moving away from the national level. In particular, future research could delve into the German case to understand the underlying mechanisms for the seemingly unique attitudes towards income inequality as well as an EU minimum wage.

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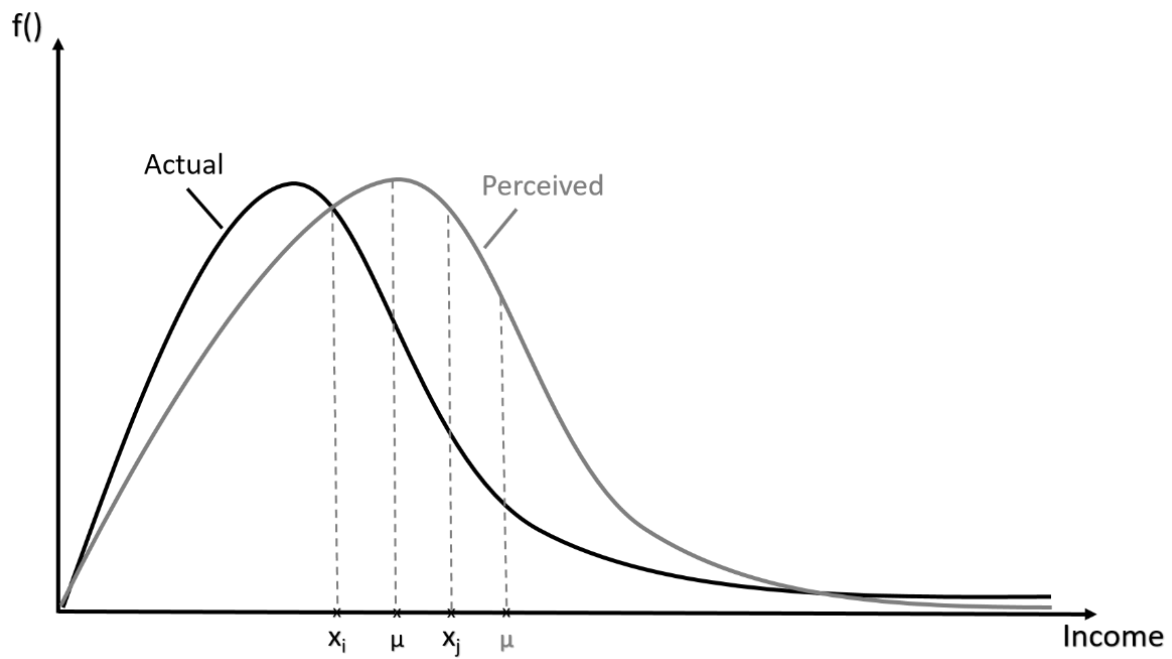
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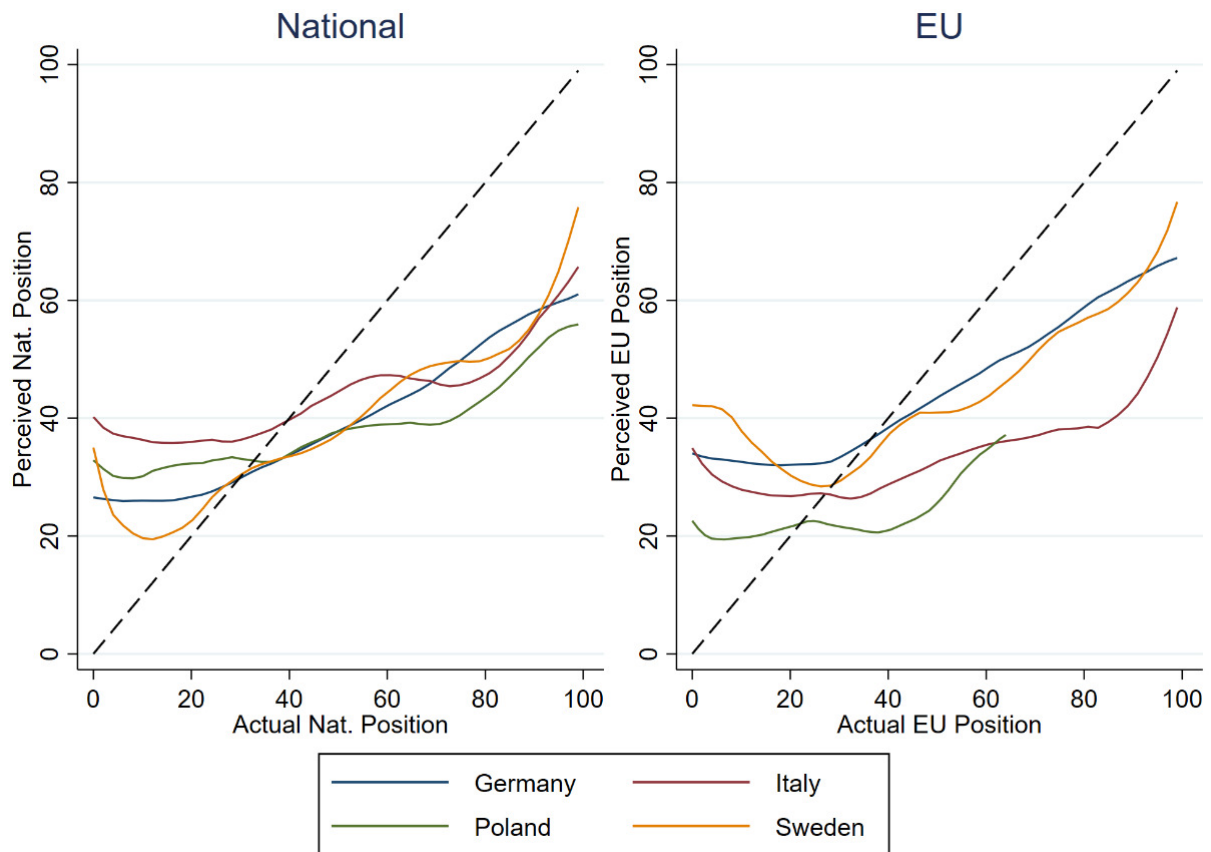
## Figures and tables

Figure 1: Actual and Perceived Income Distribution



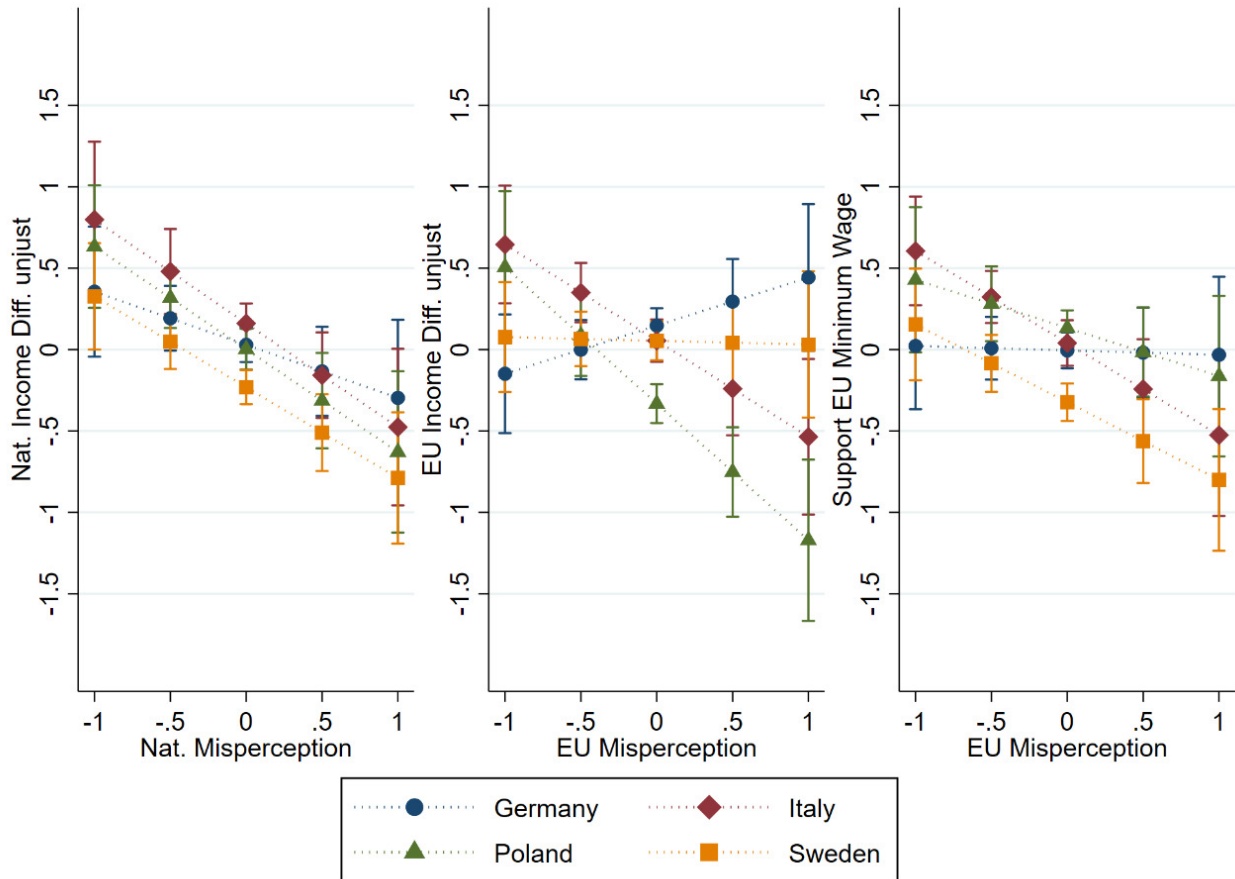
**Notes:** The figure displays the 'actual' and 'perceived' income distribution of individual  $i$ 's society.  $x_i$  denotes individual  $i$ 's income,  $\mu$  the average income of the actual or perceived distribution, and  $x_j$  denotes another individual  $j$ 's income.

Figure 2: Perceived and Actual Position at National and EU Level



**Notes:** The left panel depicts the perceived national income position as a function of the actual national income position for each country. The right panel plots the perceived EU income position against the actual EU income position. The curves are smoothed using Epanechnikov kernels with a bandwidth of 10. The curve for Poland in the right panel is cut at the 65th actual percentile, since over 93% are between the 1st and 65th percentile.

Figure 3: Attitudes towards National and EU Inequality by Misperception and Country



**Notes:** The figure depicts conditional marginal effects (with 90% confidence intervals) from models regressing attitudes towards national income differences (left panel), attitudes towards EU income differences (middle panel), and support for an EU minimum wage (right panel) against national or EU income misperception interacted with a country dummy. Dependent variables are standardized to z-scores. National and EU misperception are defined by subtracting the actual from the perceived position divided by 100. Control variables are actual income position, EU identity, gender, education, age, age<sup>2</sup>, employment status, and COVID-19 affectedness.



Table 1: Attitudes towards National and EU Income Inequality by Country

	All	Germany	Italy	Poland	Sweden
Nat. Income Differences are unjust	3.58	3.62	3.75	3.64	3.35 <sup>+</sup>
<i>disagree strongly (1) - agree strongly (5)</i>	(1.12)	(1.12)	(1.09)	(1.16)	(1.09)
EU Income Difference are unjust	3.56	3.67	3.70	3.22 <sup>+</sup>	3.61
<i>disagree strongly (1) - agree strongly (5)</i>	(1.11)	(1.08)	(1.07)	(1.18)	(1.07)
Support for EU Minimum Wage	3.59	3.60	3.75	3.77	3.29 <sup>+</sup>
<i>strongly against (1) - strongly in favor (5)</i>	(1.18)	(1.17)	(1.08)	(1.15)	(1.24)

**Notes:** Mean values with standard deviations in parentheses, restricted to respondents in the control group. <sup>+</sup> denotes significant country differences ( $p < 0.05$ ), compared to each other country. Survey weights applied.

Table 2: Attitudes towards National and EU Inequality by Income and Misperception

	Nat. Inc. Diff. unjust		EU Inc. Diff. unjust		Supp. EU Min. Wage	
Panel a) W/O Controls	(1)	(2)	(3)	(4)	(5)	(6)
Actual Nat. Position	-0.326*** (0.114)	-0.754*** (0.173)				
Nat. Misperception		-0.615*** (0.175)				
Actual EU Position			-0.149 (0.129)	-0.340* (0.176)	-0.190 (0.131)	-0.446** (0.176)
EU Misperception				-0.268* (0.162)		-0.359** (0.156)
Panel b) With Controls	(1)	(2)	(3)	(4)	(5)	(6)
Actual Nat. Position	-0.224* (0.119)	-0.639*** (0.184)				
Nat. Misperception		-0.562*** (0.172)				
Actual EU Position			-0.087 (0.138)	-0.309* (0.184)	-0.097 (0.131)	-0.374** (0.178)
EU Misperception				-0.298* (0.160)		-0.371** (0.156)
Observations	1149	1149	1149	1149	1149	1149
Country FE	yes	yes	yes	yes	yes	yes

**Notes:** Coefficients and robust standard errors (in parentheses) from OLS regressions with survey weights applied, restricted to respondents in the control group. Dependent variables are standardized to z-scores and denote in Model 1 and 2 attitudes towards national income differences, in Model 3 and 4 towards EU income differences, and in Model 5 and 6 support for an EU minimum wage. Independent variables are the actual national and EU income position, ranging from percentile 1 to 100 divided by 100, and national and EU misperception, defined by subtracting the actual from the perceived position divided by 100. Control variables in Panel b) are EU identity, gender, education, age, age<sup>2</sup>, employment status, and COVID-19 affectedness. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

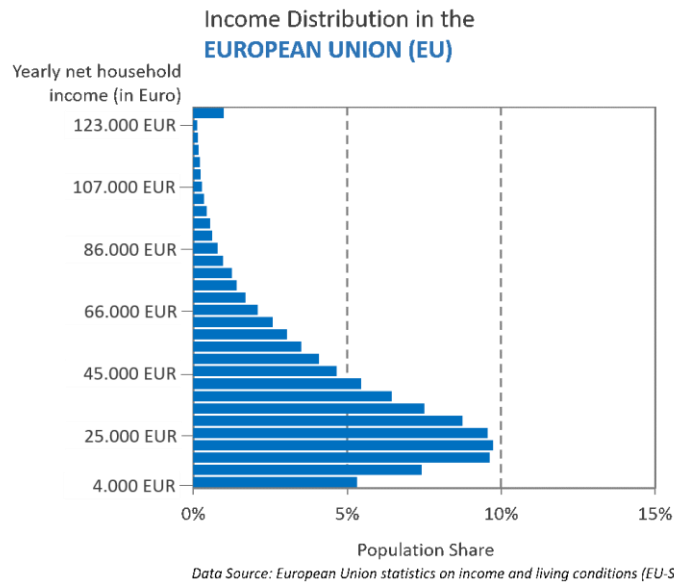
Table 3: Effect of Survey Experiment on Attitudes towards EU Inequality

	EU Inc. Diff. unjust				
	All	Germany	Italy	Poland	Sweden
Panel a)	(1)	(2)	(3)	(4)	(5)
TRT x Underestimate	-0.099*	0.078	-0.254**	-0.193	-0.051
	(0.056)	(0.105)	(0.113)	(0.129)	(0.114)
TRT x Overestimate	0.033	-0.254*	0.032	0.247	-0.034
	(0.085)	(0.148)	(0.177)	(0.172)	(0.177)
P-value diff.	0.189	0.068	0.169	0.038	0.934
	Supp. EU Min. Wage				
	All	Germany	Italy	Poland	Sweden
Panel b)	(1)	(2)	(3)	(4)	(5)
TRT x Underestimate	0.034	0.294***	0.137	-0.083	-0.188
	(0.055)	(0.098)	(0.101)	(0.112)	(0.118)
TRT x Overestimate	-0.080	-0.393**	0.008	-0.052	0.105
	(0.085)	(0.155)	(0.166)	(0.148)	(0.186)
P-value diff.	0.253	0.000	0.501	0.867	0.177
Observations	2239	551	576	496	616

**Notes:** Coefficients and robust standard errors (in parentheses) from OLS regressions with survey weights applied. Dependent variables are standardized to z-scores and denote in panel a) attitudes towards EU income differences and in panel b) support for an EU minimum wage. Respondents in the treatment (TRT) group were informed about their actual EU income position. *TRT x Underestimate* (*TRT x Overestimate*) is the treatment effect among respondents who estimated an income position that is lower (higher) than their actual income position within the EU. All regressions include as control variables actual EU income position, EU identity, gender, education, age, age<sup>2</sup>, employment status, and COVID-19 affectedness. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## Appendix

Figure A1: Information Treatment - Slide 1



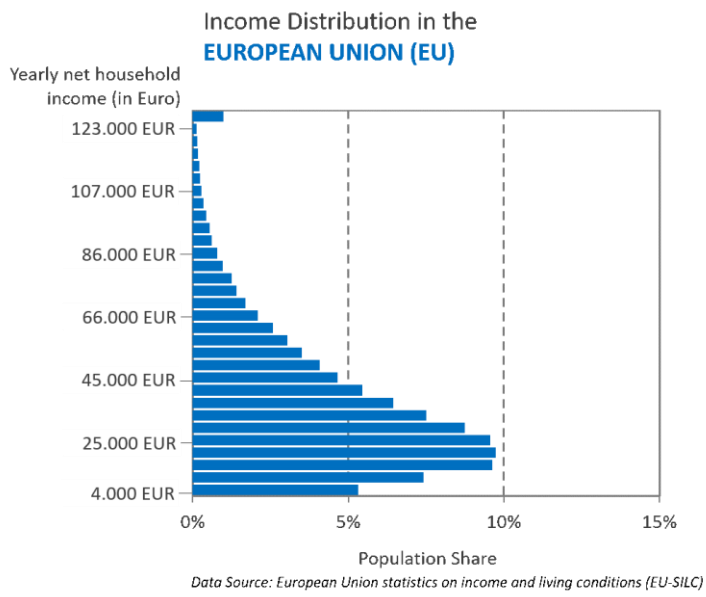
The figure depicts different yearly incomes in the EU from bottom to top. At the bottom are households with little or no yearly income and at the top are households with a yearly income of 123.000 Euro or more.

The bars denote how many households in the EU have a certain annual income. The longer the bar is, the larger is the share of households that earns a particular income.

As you can see, income in the EU is not equally distributed because some households have more income and others have less.

**Notes:** Figure A1 informs respondents about the shape of the EU income distribution.

Figure A2: Information Treatment - Slide 2



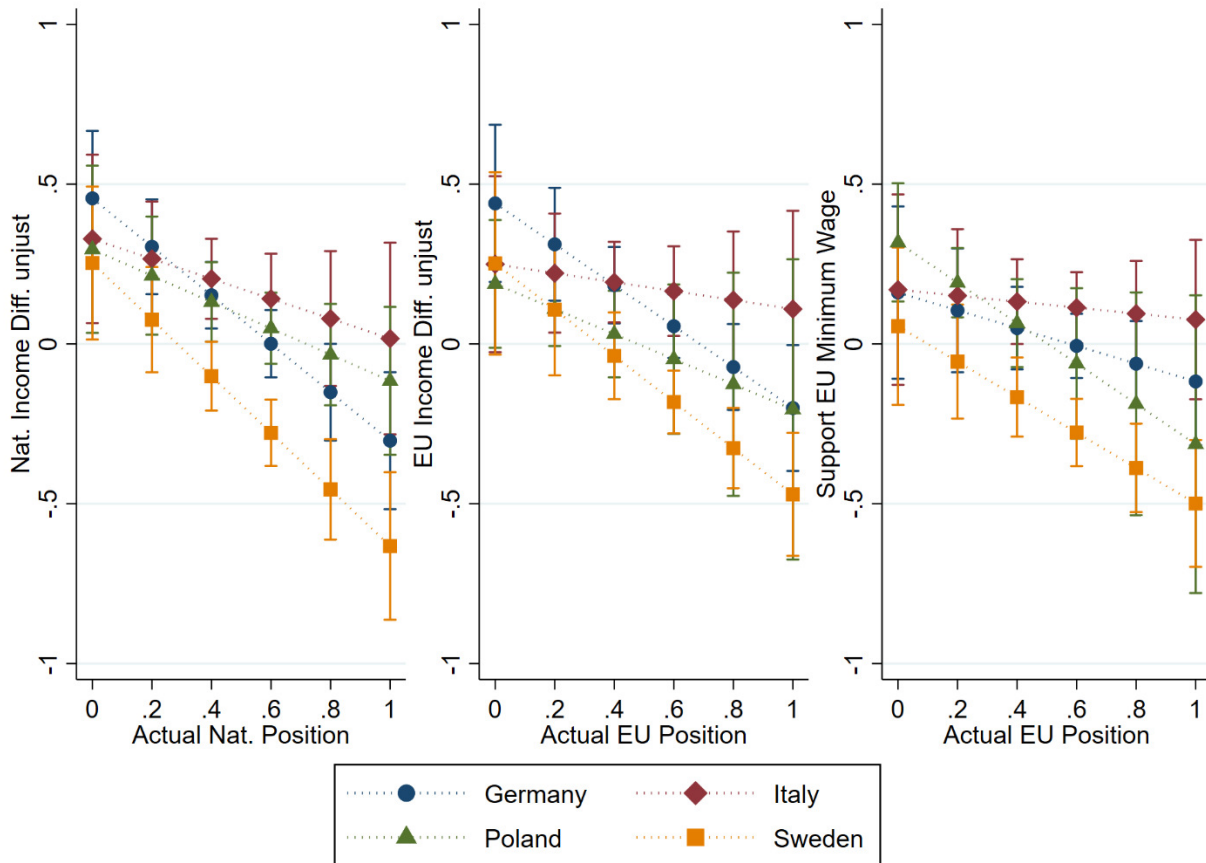
As a reminder: You indicated to have a yearly income of \_\_\_\_\_ Euro.

In the EU:

- \_\_\_\_\_ percent of households are poorer than you.
- \_\_\_\_\_ percent was your guess.

**Notes:** Figure A2 informs respondents about their actual income position within the EU income distribution.

Figure A3: Attitudes towards National and EU Inequality by Actual Income Position and Country



**Notes:** The figure depicts conditional marginal effects (with 90% confidence intervals) from models regressing attitudes towards national income differences (left panel), attitudes towards EU income differences (middle panel), and support for an EU minimum wage (right panel) against the actual income position interacted with a country dummy. Dependent variables are standardized to z-scores. The actual national and EU income position range from percentile 1 to 100 divided by 100. Control variables are income misperception, EU identity, gender, education, age, age<sup>2</sup>, employment status, and COVID-19 affectedness.

Table A1: Summary Statistics and Balancing

	Summary Statistics and Balancing														
	Germany					Italy			Poland			Sweden			
	Min	Max	Control Mean	TRT Mean	Diff	Control Mean	TRT Mean	Diff	Control Mean	TRT Mean	Diff	Control Mean	TRT Mean	Diff	
Actual Nat. Position	1	100	51.50	50.30	-1.20	47.17	44.27	-2.90	47.17	44.27	-2.90	47.17	44.27	-2.90	
Actual EU Position	1	100	58.53	57.73	-0.80	48.47	45.67	-2.80	48.47	45.67	-2.80	48.47	45.67	-2.80	
Perceived Nat. Position	1	100	40.55	40.98	0.43	43.98	45.2	1.22	43.98	45.2	1.22	43.98	45.2	1.22	
Perceived EU Position	1	100	47.45	49.73	2.28	33.58	34.95	1.37	33.58	34.95	1.37	33.58	34.95	1.37	
Age	18	89	48.13	50.38	2.25	48.29	48.14	-0.16	48.29	48.14	-0.16	48.29	48.14	-0.16	
Female	0	1	0.47	0.45	-0.02	0.48	0.5	0.02	0.48	0.5	0.02	0.48	0.5	0.02	
Low Education	0	1	0.16	0.19	0.03	0.46	0.46	0.01	0.46	0.46	0.01	0.46	0.46	0.01	
Medium Education	0	1	0.55	0.52	-0.03	0.41	0.41	0.00	0.41	0.41	0.00	0.41	0.41	0.00	
High Education	0	1	0.29	0.29	0.00	0.14	0.13	-0.01	0.14	0.13	-0.01	0.14	0.13	-0.01	
Working	0	1	0.59	0.52	-0.07	0.48	0.53	0.05	0.48	0.53	0.05	0.48	0.53	0.05	
EU Identity	0	1	0.19	0.17	-0.02	0.19	0.17	-0.02	0.19	0.17	-0.02	0.19	0.17	-0.02 <sup>+</sup>	
Covid-19 Affectedness	0	1	0.13	0.08	-0.05 <sup>+</sup>	0.13	0.12	-0.01	0.13	0.12	-0.01	0.13	0.12	-0.01	

**Notes:** The table shows average values for control and treatment group for Germany, Italy, Poland, and Sweden. *Diff* denotes the differences in means between both groups. Significant differences ( $p < 0.05$ ) are marked with <sup>+</sup>. Survey weights applied.

Table A2: Determinants of Misperceptions and EU Inequality Attitudes by Country

	Germany			Italy			Poland			Sweden		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Actual EU	-0.965***	-0.052	0.278*	-1.099***	-0.023	0.132	-1.120***	-0.010	-0.349	-0.895***	-0.051	-0.107
Position	(0.065)	(0.161)	(0.160)	(0.055)	(0.149)	(0.140)	(0.099)	(0.248)	(0.226)	(0.060)	(0.147)	(0.163)
Higher	-0.029	-0.115	-0.027	0.007	-0.023	0.082	-0.156**	-0.076	-0.348**	0.103**	-0.102	-0.054
Education	(0.046)	(0.115)	(0.114)	(0.033)	(0.091)	(0.085)	(0.061)	(0.151)	(0.138)	(0.041)	(0.100)	(0.111)
Working	0.128***	-0.014	-0.076	0.017	-0.198**	-0.175**	-0.004	0.045	0.217**	0.092**	-0.023	0.125
	(0.037)	(0.093)	(0.092)	(0.032)	(0.087)	(0.081)	(0.046)	(0.114)	(0.104)	(0.036)	(0.089)	(0.098)
Female	-0.068**	-0.017	-0.012	-0.013	-0.042	-0.111	0.029	0.156	0.277***	-0.024	0.01	0.071
	(0.034)	(0.085)	(0.084)	(0.032)	(0.088)	(0.082)	(0.042)	(0.104)	(0.095)	(0.032)	(0.079)	(0.088)
Age	0.000	0.000	0.002	0.000	-0.007**	0.001	-0.002	0.008**	0.010***	-0.001	0.005**	-0.003
	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.003)	(0.001)	(0.002)	(0.003)
EU Identity	0.000	0.224**	0.267**	0.072*	0.072	0.041	0.019	0.129	0.046	0.018	0.131	0.037
	(0.045)	(0.114)	(0.112)	(0.041)	(0.111)	(0.104)	(0.056)	(0.139)	(0.127)	(0.064)	(0.157)	(0.174)
Altruistic	0.049	0.432***	0.378***	0.002	0.204**	-0.011	0.058	0.053	0.007	0.022	0.089	0.266***
	(0.037)	(0.093)	(0.092)	(0.030)	(0.083)	(0.077)	(0.046)	(0.114)	(0.104)	(0.034)	(0.082)	(0.091)
Political	0.008	-0.205***	0.048	0.029*	-0.202***	-0.048	0.030	-0.213***	0.084*	0.015	-0.046	0.162***
Trust in EU	(0.018)	(0.044)	(0.044)	(0.016)	(0.045)	(0.042)	(0.022)	(0.055)	(0.050)	(0.016)	(0.040)	(0.045)
Political	-0.029	-0.245***	-0.235***	0.039***	-0.173***	-0.158***	0.018	-0.108**	-0.073	-0.012	-0.376***	-0.268***
Position	(0.022)	(0.056)	(0.055)	(0.014)	(0.039)	(0.037)	(0.020)	(0.049)	(0.045)	(0.015)	(0.037)	(0.041)
Observations	516	516	516	513	513	513	437	437	437	556	556	556

**Notes:** Coefficients and robust standard errors (in parentheses) from OLS regressions with survey weights applied by country. For each country, dependent variable in the first column is the probability to overestimate one's EU income position (ref. underestimate), in the second column attitudes towards EU income differences, and in the third column support for an EU minimum wage. The latter two variables are standardized to z-scores. Independent variable *Actual EU position* ranges from percentile 1 to 100 divided by 100; *Political Trust in the EU* (range: low to high trust) and *Political Position* (left- to right-wing) are standardized to z-scores; *Higher Education* and *Altruistic* are dummies, denoting whether respondents have medium or high education, and altruistic values. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .