

Bublitz, Elisabeth; Jäger, Julian; Wang, Hequn; Beblo, Miriam; Lohmann, Henning

Working Paper

Where do I stand in the EU? Income comparisons and perceptions

WiSo-HH Working Paper Series, No. 66

Provided in Cooperation with:

University of Hamburg, Faculty of Business, Economics and Social Sciences, WISO Research Lab

Suggested Citation: Bublitz, Elisabeth; Jäger, Julian; Wang, Hequn; Beblo, Miriam; Lohmann, Henning (2022) : Where do I stand in the EU? Income comparisons and perceptions, WiSo-HH Working Paper Series, No. 66, Universität Hamburg, Fakultät für Wirtschafts- und Sozialwissenschaften, WiSo-Forschungslabor, Hamburg

This Version is available at:

<https://hdl.handle.net/10419/263990>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

FAKULTÄT
FÜR WIRTSCHAFTS- UND
SOZIALWISSENSCHAFTEN

Where do I stand in the EU? Income Comparisons and Perceptions

Elisabeth Bublitz
Julian Jäger
Hequn Wang
Miriam Beblo
Henning Lohmann

WiSo-HH Working Paper Series
Working Paper No. 66
August 2022



WiSo-HH Working Paper Series
Working Paper No. 66
August 2022

Where do I stand in the EU? Income Comparisons and Perceptions

Elisabeth Bublitz, University of Hamburg
Julian Jäger, University of Hamburg
Hequn Wang, University of Hamburg
Miriam Beblo, University of Hamburg
Henning Lohmann, University of Hamburg

ISSN 2196-8128

Font used: „TheSans UHH“ / LucasFonts

Die Working Paper Series bieten Forscherinnen und Forschern, die an Projekten in Federführung oder mit der Beteiligung der Fakultät für Wirtschafts- und Sozialwissenschaften der Universität Hamburg tätig sind, die Möglichkeit zur digitalen Publikation ihrer Forschungsergebnisse. Die Reihe erscheint in unregelmäßiger Reihenfolge.

Jede Nummer erscheint in digitaler Version unter
<https://www.wiso.uni-hamburg.de/de/forschung/working-paper-series/>

Kontakt:

WiSo-Forschungslabor
Von-Melle-Park 5
20146 Hamburg
E-Mail: experiments@wiso.uni-hamburg.de
Web: <http://www.wiso.uni-hamburg.de/forschung/forschungslabor/home/>



Where do I stand in the EU?

Income Comparisons and Perceptions

Elisabeth Bublitz Julian Jäger Hequn Wang Miriam Beblo

Henning Lohmann

Universität Hamburg, Germany

June 2022

Abstract

With a survey experiment conducted in Germany, Italy, Poland, and Sweden, we investigate how EU citizens rank themselves within the EU. In all four countries, (mis-)perceptions of EU income positions result primarily from respondents' (incomplete) information about their national position and their perceived country ranking within the EU. Low-income respondents tend to place themselves higher and richer respondents lower in both the national and EU income distribution. Respondents who are informed about their income position estimate their EU ranking more accurately in a follow-up survey. Our findings show that concepts of inequality at the EU level are empirically meaningful and that EU citizens have a reference frame beyond their own country.

Keywords: Perceptions, Inequality, European Union, Survey Experiment

JEL classification: C91, D31, H24

1 Introduction

The European Union consists of member states with rather diverse economic backgrounds. For instance, a Swedish citizen has a three times higher median income than a Polish citizen and a six times higher median income than a Bulgarian citizen. Despite these significant inequalities between member states, most of the research on inequality in Europe focuses on inequality within a country. However, gaining a more thorough understanding of the inequalities between member states would improve the assessment of policies that address this matter. Leaving out a supra-national perspective of inequality becomes even more problematic when, with the process of European integration, citizens' national frame of reference may increasingly be replaced with the supra-national one of the EU. Thus, economic disparities between member states may more and more affect how EU citizens perceive their own economic situation relative to that of their co-citizens.

This paper is the first to explore how EU citizens place themselves within the EU regarding their income and to analyze potential mechanisms that influence this positioning. We collected data with an online survey from the four ideal-typical EU member states Germany, Italy, Poland, and Sweden in March 2020 and a follow-up survey in Germany in June/July 2020. Separate data were collected from Germany in a pre-test in November 2019. In each survey, respondents reported their perceived national and EU income positions as well as their ranking of their country against the EU average. A core feature of the cross-country survey was a survey experiment, in which we allocated respondents in each country into two treatment groups and one control group. The first treatment informed one-third of the respondents about their actual income position within the EU. The second treatment informed another third about their actual income position within the EU and within their country. The control group did not receive any information. The follow-up survey allows us to investigate potential long-term effects of the treatments in Germany around three months later. As we conducted the surveys during the COVID-19 pandemic in Europe, we control for individual COVID-19 affectedness.

We obtain three main findings. *First*, in all four countries, respondents place themselves within the EU by using their national income position and their perceived country

ranking as reference points. The majority of respondents in Germany and Sweden correctly rank their country’s economic situation better than the EU average and, in line with that, report a higher EU than national income position. In turn, the majority of Polish respondents correctly and Italian respondents incorrectly rank their country lower than EU average and, following through with this logic, estimate a lower EU than national income position. *Second*, the systematic link of EU to national income perceptions explains the direction and size of respondents’ income misperceptions at EU level. We find that EU income misperceptions are primarily the result of respondents’ (incomplete) information about their national position and their country ranking. Consequently, respondents misperceive their EU income position as much as their national income position: Poorer respondents place themselves higher and richer respondents place themselves lower in both the national and cross-national income distribution. *Third*, EU citizens’ find their own placement within the EU meaningful enough to be remembered. In the follow-up survey, German respondents assess their income position at the EU level significantly more accurately when having received information about their actual EU income position in the main survey.

Our analysis is guided by a theoretical framework for the formation of EU income (mis-)perceptions where we extend the widely acknowledged reference group theory (e.g. Hyman and Singer, 1968; Merton, 1968) from the national to the supra-national level of the EU. We hereby rely most importantly on the study by Cruces, Perez-Truglia, and Tetaz (2013), who conducted a survey experiment on income perceptions in Argentina. They find that perceived national income positions more strongly correlate with respondents’ rank within their direct neighborhood than within their country. Our findings confirm our theoretical predictions that respondents use their position within the national distribution as a point of reference for estimating their EU income position. Furthermore, we show that respondents account for differences between both income positions based on how they rank their country compared to the EU average. Accordingly, one of our main contributions is the result that EU citizens are not only aware of the economic disparities across EU countries, but that they are also capable of applying this knowledge at the

individual-level to assess their income positions within the EU. This finding is far from trivial given the cognitive biases evidenced by many studies in behavioral economics and cognitive psychology (e.g. Tversky and Kahnemann, 1974; Kahnemann et al., 1982).

We largely build on the growing empirical literature on (mis-)perceptions of inequality. One strand of this literature focuses on misperceptions of national indicators, such as the extent of income, wealth, and educational inequality or of social mobility (e.g. Norton and Ariely, 2011; Kuziemko et al., 2015; Hauser and Norton, 2017; Alesina et al., 2018; Lergertporer et al., 2020; Trump, 2018). Osberg and Smeeding (2006) and Gimpelson, and Treismann (2018) show that respondents in most Western countries misperceive the extent of national income inequality. Bussolo et al. (2021) find quite stable inequality perceptions in European countries of the former Eastern Bloc and Scandinavia between 1992 and 2009, but perceptions of increasing inequality in continental Western Europe.

A strand to which our paper connects more strongly focuses on respondents' perceptions of their personal rank in the income distribution (e.g. Cruces et al., 2013; Karadja et al., 2017; Engelhardt and Wagener, 2018; Fernández-Albertos and Kuo, 2018; Bublitz, 2020; Hvidberg et al., 2020; Hoy and Mager, 2021). In these studies, usually less than one third of respondents perceive their national income position correctly and respondents in lower income deciles on average overestimate their income position, whereas respondents in higher deciles underestimate it. These findings were evident in diverse countries such as Argentina, Brazil, Denmark, France, Germany, Spain, Sweden, UK, the US, and Russia (Cruces et al., 2013; Karadja et al., 2017; Engelhardt and Wagener, 2018; Bublitz, 2020; Hvidberg et al., 2020). However, all these studies concentrate on income perceptions at the national level. As pointed out earlier, policymaking is shifted more and more to the supra-national level and it is thus important to widen our research perspective.

To our knowledge, only Fehr, Mollerstrom, and Perez-Truglia (2019) have attempted this conceptual shift, using survey data from Germany to analyze national as well as global income perceptions. They find that German respondents on average greatly underestimate their global income position and misperceive it much more strongly than their position at the national level. In our own study, we ask respondents about their

personal income position within the EU – a geographically smaller unit with a political and economic union. It is fair to assume that EU citizens have more knowledge about the EU than about the world as a whole as it also has a more direct impact on their lives. Our survey design has the further advantage that it reduces the risk of overburdening respondents when we ask them about their income position within the EU and simultaneously increases the precision of the question. In addition, and in contrast to most studies on income misperceptions, we carefully elicit respondents’ EU income perceptions with a rich data set of cross-country as well as panel data. Thus, our findings reach greater external validity than previous studies.

Furthermore, our study is linked to the survey literature on European comparisons. Delhey and Kohler (2006) find that citizens in Turkey, Hungary, and (East and West) Germany perceive differences in living conditions across European countries quite accurately. In Lahusen and Kiess’ (2019) replication study for nine European countries respondents are on average well aware of the different living conditions across European countries. These studies have so far shed light on how Europeans perceive differences in living conditions between EU countries. We contribute to this strand of literature by analyzing income comparisons between EU citizens and their relationship with EU citizens’ knowledge of economic differences across member states.

At the policy level, our paper contributes to debates about inequality and poverty within the EU. Due to income disparities across EU member states, the conventional poverty measure “at risk of poverty” has different consequences for e.g. Polish and Swedish citizens. In turn, to base policies on poverty measures with EU wide thresholds, such as 60% of the median income at EU level, would consider these country differences but at the same time reduce the relative importance of inequalities within countries (Fahey, 2007; Whelan and Maître, 2009). We find that EU citizens are aware of the different economic situation within their country and the EU and that they regard their income position in the EU as relevant enough to be remembered. Our results therefore show that concepts of inequality at the EU level are “empirically meaningful” to EU citizens, in the sense that they reflect their personal economic situation within the EU.

Our paper proceeds as follows: Section 2 presents our theoretical background. Section 3 gives a summary of the data collection and the survey. In Section 4, we analyze the formation of EU income perceptions: Section 4.1 focuses on perceived and actual income positions at the EU and national level, Section 4.2 discusses the perceived difference between EU and national income positions, and in Section 4.3, we analyze EU income misperceptions. In Section 5, we present the experimental results. Section 6 concludes.

2 Theoretical background: EU Income Perceptions and Reference Groups

The literature on cognitive biases shows that when faced with complex problems, people employ so-called ‘heuristics’, e.g. rules of thumb or educated guesses (Kahneman et al., 1982). With these mental shortcuts individuals do not simply get things wrong but make systematic errors when aiming to solve complex decision-making problems. Applying this concept, Cruces et al. (2013) assume that individuals make an educated guess to estimate the national income distribution. Inference based on reference groups (Hyman and Singer, 1968; Merton, 1957) is a special case of the so-called ‘availability heuristic’.

Following these insights, Cruces et al. (2013) argue that individuals only observe the incomes of their close surroundings as the reference group and then infer the income distribution of the whole population from this sub-sample. We illustrate this inference process with Figure 1, where, for the sake of simplicity, we assume all income distributions (actual and estimated) to be approximately normally distributed. The solid curve shows the income distribution for the entire national population. The area below this curve up to individual i ’s actual income equals the share in the population that is poorer than individual i . The dotted curve shows the income distribution of individual i ’s reference group, let us say, the neighborhood, which she directly observes. Since this curve is to the left of the actual income distribution, she belongs to a neighborhood that is poorer in national comparison.

A completely naïve individual will conflate the income distribution of her neighbor-

hood with the distribution of the whole country. In contrast, a completely rational agent will have perfect information and correctly infer the actual national income distribution from the income distribution of her reference group and perceive a position that is equal to her actual position. Leaving these border cases aside, as long as individual i knows that she belongs to a poorer neighborhood, she will rank her neighborhood lower than the whole country and estimate a national income distribution that is to the right of the income distribution of her neighborhood. The dashed curve in Figure 1 depicts such an estimated national income distribution for the scenario that individual i knows to live in a poorer neighborhood. The difference between the actual and perceived distribution signifies that individual i still misperceives her actual national income position. Here, the perceived distribution is to the left of the actual distribution. Therefore, individual i overestimates her income position, that is, she perceives a national position that is higher than her actual income position. The difference between the area below the solid curve and the area below the dashed curve measures the size of the misperception. Thus, the larger the difference, the larger individual i 's income misperception.

<place figure 1 about here>

We now add to this framework the formation of income perceptions at the EU level. In short, we assume that EU citizens use their perceived national income position as a point of reference to estimate their EU income position, in the same way as they use their position within their neighborhood to estimate their national income position. We particularly assume that EU citizens infer the income distribution of the whole EU population from their perceived national distribution and estimate their EU income position as lower, equal or higher than their national position, depending on how they rank their country against EU average.

We illustrate this inference process in Figure 2. The gray curve with a solid line shows the income distribution for the entire EU population. It is to the left of individual i 's

actual national income distribution. Therefore, individual i lives in a country that is richer than the EU average. Next, we look at the perceived national and EU income distribution (dashed lines) which are depicted to be between the actual distributions. We assume that individual i incorrectly ranks her country lower within the EU, not knowing that she actually lives in a rich EU country. In this scenario, she will report an EU position that is lower than her perceived national position. The perceived EU income distribution is thus to the right of the perceived national distribution curve. The difference between the actual and perceived EU income distribution denotes that individual i misperceives her EU income position. In particular, she underestimates her position, since she estimates a lower than actual income position within the EU. Naturally, other scenarios of overestimation and underestimation are possible where the final estimates depend on the shift and overlap of the curves. However, the overall logic continues to hold in each case.

<place figure 2 about here>

Figure 2 shows that misperceptions at the EU level may result from two main sources: (i) *Incorrect national income position*: Individual i already misperceives her national position, which leaves her with an incorrect starting point when she extrapolates from her national position to the EU level. (ii) *Incorrect country ranking*: Individual i does not know the correct rank of her country in the EU. Using a false country ranking, individual i ends up with an incorrectly perceived difference between national and EU income position, which in the example above results in underestimating her EU and overestimating her national income position.

3 Data

3.1 *Data Collection*

To quantify any income misperceptions and investigate their sources, we conducted online surveys in the four EU member states Germany, Italy, Poland, and Sweden between March 6 and March 31 2020. Data collection was administered by YouGov Germany. We drew quota samples of respondents aged 18 years and above from online access panels using the following criteria: gender (male, female), age (18-33, 35-54, 55 or older), education (low, middle, high), and income (12 categories). In total, 6,181 respondents participated in the survey, with 1,535 respondents in Germany, 1,532 in Italy, 1,561 in Poland, and 1,553 in Sweden.

The choice of the countries was guided by the motivation to include countries with different economic backgrounds. Table 1 depicts these differences. For instance, average median equivalized net household income is above EU average in Germany (23,504 €) and Sweden (24,490 €), close to EU average in Italy (17,165 €), and below average in Poland (7,142 €).

<place table 1 about here>

We additionally conducted a pre-test in November 2019 and a follow-up survey in June/July 2020 in Germany. In the pre-test, we implemented questions in a multi-topic survey from YouGov Deutschland, with a sample size of 2,022 respondents. In the follow-up survey, we re-contacted respondents from the main survey, with a high response rate of 85%, resulting in 1,304 observations. For a detailed description of the surveys including English translations of the questionnaires see Anonymised (2021).

3.2 *Survey and Main Variables*

In the *main survey*, respondents were asked about their socio-political orientation, followed by detailed questions on their income, perceived income positions (national and EU), and their ranking of their country within the EU. One third of the respondents were then randomly assigned to receive information about their actual EU income position (Single treatment), another third received both information about their actual income position in the EU and in their country (Double treatment), and the last third of the respondents received no information at all (control). Actual income positions were calculated by comparing survey income information against income distributions derived from data of the EU Statistics on Income and Living Conditions (EU-SILC). We chose EU-SILC as reference as it allowed for comparisons of national and EU income distributions. Figure A1 and Figure A2 in the appendix depict the information that were shown to respondents in both treatments in the main survey. In the follow-up survey, respondents were again asked about their perceived income positions, their exposure to the pandemic, and their assessment of the measures undertaken by the government to tackle the crisis.

The core questions for our analysis in this paper are those on income and the perceived income positions. We first asked respondents to state their net household income in the previous year (2019). Afterwards, they had to estimate their income position within their own country and within the EU:

How many percent of the population in <COUNTRY> (18 years or older) do you think had a total yearly net household income which was lower than yours in 2019? (National Position)

The European Union (EU) currently has 28 Member States and their general economic situation is quite different (e.g. Denmark, France, Portugal and Bulgaria). Now think about your net household income and compare it with the population of all 28 EU Member States. How many percent of the EU population (18 years or older) do you think had a total yearly net household

income which was lower than yours in 2019? (EU Position)

As you can see, the wording of the question about the perceived EU income position included information on the inequalities across EU member states and additionally mentioned four countries with different economic conditions. This information increased the likelihood that respondents had a similar picture of the European Union in mind when estimating their EU income position.

To examine to which extent EU citizens are aware of the difference between their own national and EU income position, we included a further question on how respondents rank their country’s economic situation compared to the EU average. The answer categories range from 1 (“much better”) to 5 (“much worse”). For the data analysis, we summarize the categories into lower than EU average, about EU average, and higher than EU average.

As we focus on how respondents place themselves within the EU, we control for the national identity of the respondents. The variable measures whether respondents identify themselves only as citizens of their own country or rather as EU citizens. We also control for sociodemographic characteristics including gender, education, age, number of children, and employment status. Lastly, as our data collection happened to take place during the first wave of the COVID-19 pandemic, we included a variable measuring COVID-19 infections in respondents’ surroundings in our main analysis.

The *follow-up survey* in Germany repeats questions from the main survey and additionally asks about topics on COVID-19. As we re-contacted the same respondents from the main survey, the data can be analyzed as a two-wave panel for the repeated questions. We use the panel structure in this paper to analyze if the treatments had any long-lasting effect on respondents’ income perceptions three months later.

In the *pre-test* in Germany, we implemented the questions about national and EU income perceptions and perceived country rank. The survey additionally included a question order treatment, where half of the respondents (National First group) had to first think about their national income position before being asked about their EU income position. The other half (EU First group) had to estimate first their EU income position. We use this data to further analyze how individuals form their EU income perceptions

based on their perceptions at national level.

3.3 Data Quality, Sample Characteristics, and Randomization

Before stating their income, respondents were asked to indicate all types of income sources (e.g. income from employment, social benefits). The question primed respondents to think about different relevant income sources and therefore was supposed to reduce the likelihood to understate one’s income. The grand share of income comes from employment, ranging from around 67% in Sweden to up to 75% in Poland (Table A1). Around one third in each country stems from retirement payments and pensions. The stated income source is in almost all cases in line with the employment status of the respondent.

To ensure comparability, we asked about the annual net household income in each participating country. We chose disposable income, since for measures of inequality, any income, not only earnings, matters. Following the standard assumption that individuals pool and share their incomes within households, we asked about household (not individual) income. A comparison of our sample distributions with reference distributions (EU-SILC) shows no larger under- or overrepresentation of respondents in higher or lower income deciles (Figure A3). An exception is the sample in Italy, where respondents in the first national income decile are slightly overrepresented (18%).

In the data cleaning process, we found that some respondents in Germany and Poland obviously mistook monthly income for annual income, resulting initially in larger shares of respondents in the first two income percentiles. We compared yearly income information with additional information from a question on monthly net household income, which was asked by YouGov for sample screening purposes before the actual survey started. In fact, from this comparison it seems plausible that many respondents with very low yearly incomes erroneously reported monthly incomes. For respondents, where such a consistency exists, we recoded their monthly as annual income by multiplying it by 12.¹

¹ We illustrate our recoding by an example: For a respondent in Germany who indicated a yearly net household income of 1,300 €, we interpreted her income as monthly income and

In total, we recoded the income variable of 256 respondents in Poland and 175 respondents in Germany.

We added follow-up questions on income that asked respondents who had clicked ‘Don’t know’ to make a fair guess. This substantially reduced the number of missing values for stated income and the estimates of their national and EU income position (Table A2). Over all countries, the follow-up reduced missing values in income by 27%, in the national income position by 29% and in the EU income position by 15%. We also see cross-country differences in response behavior, e.g. almost 29% of respondents in Italy did not estimate any national income position compared to less than 18% of respondents in Sweden. These differences might reflect that in Sweden knowledge about yearly net income is more prevalent, whereas Italians are more familiar with their yearly gross income.

Across all countries, missing values are highest for the EU income position, followed by the national income position and stated income. This could result from a lack of familiarity with the EU or from the complexity of estimating the EU income position. However, even in Germany, the country with the highest difference between missing values of EU and national income positions, the difference is only six percentage points. Thus, the question on the EU income position seems not to overburden respondents in any country (or at least not substantially more than the question on the national income position). Comparing average responses, we see that those respondents, who reported income only after being encouraged to do so by the follow-up questions, stated multiplied it by 12 (12x1,300=15,600), if the respondent indicated belonging to the 1,000-1,499 € income screening group or plus/minus one income screening group. We allow for such a difference between screening group and stated income for three reasons: First, in the screening, respondents were asked about their current income, while we asked respondents about their income in the previous year. Second, in the screening, respondents had to choose the income group they belonged to, while we asked them to state their exact income. Third, we primed respondents about their sources of income. So, respondents might state a higher income, now accounting for these other income sources, which they did not in the screening.

significantly lower income as well as lower national and EU income positions in Sweden, significantly lower national and EU income positions in Germany, and significantly lower national income positions in Poland and Sweden. Differences are substantially large in Sweden and Germany and we account for these imbalances with robustness checks by excluding respondents who answered a follow-up question.

Table 2 shows the sample characteristics for each country along all covariates for the main survey. We also tested if treatment and control group in the pre-test and in the follow-up survey in Germany are balanced. For the pre-test, we find evidence for perfect randomization between both groups (Table A3). For the follow-up survey, control and single treatment group are fully balanced along the main observable covariates (Table A4). However, weakly significant imbalances exist between control and double treatment group for the actual national and EU income position ($p\text{-value} < 0.1$). We account for these imbalances by including covariates within our regression models. The (overall) successful randomization allows us to attribute any differences between control and treatment group in both surveys causally to the treatment.

<place table 2 about here>

4 From National to EU Income (Mis-)Perceptions

Figure 3 depicts the perceived and actual income positions on the national and EU level for each country. The dark gray bars represent the perceived income deciles of the respondents. The white bars represent the actual income deciles.

The difference in the actual distributions at EU- (left) and national level (right) already captures the different economic ranking of the country within the EU: For instance, around 50% of Polish respondents are in fact located in the lower half of the Polish income distribution. However, within the EU income distribution around 88% of Polish

respondents find themselves in the lower half. In contrast, while 45% of Swedish respondents are below the median in Sweden, only about 30% stand in the lower half of the EU income distribution.

We see substantial differences between the perceived and actual income decile at the national level in each country. In line with previous studies, perceived national income positions show a tendency towards the middle in all countries but most visibly for Poland and Germany. Thus, respondents are underrepresented in the lowest and highest perceived income deciles and overrepresented in the perceived middle deciles. For the EU level, the histograms show a similar pattern for Germany and Sweden. Italians show a greater underestimation on the EU than the national level whereas Poles have more accurate estimates.

<place figure 3 about here>

For the following three sub-sections, we take Figure 3 as our starting point and first test our theoretical prediction that EU citizens use the national income position as a reference point to estimate their EU income position (4.1). Then, we investigate if respondents perceive a higher or lower EU than national position in accordance with their perceived country ranking (4.2). After, we analyze the formation of EU income misperceptions (4.3), based on the two sources, incorrect national income position and incorrect country ranking, as discussed in the theory part.

4.1 *Perceived EU and National Income Position*

First, we investigate the prediction that EU citizens rely on their national income position as a reference point. To that end, we regress the perceived EU income percentile stepwise on the perceived national income percentile, the actual EU income percentile, and several control variables (national identity, education, age, number of children, employment status, and COVID-19 affectedness).

Results in column 1 of Table 3 show a positive and significant association between the perceived national and EU income position for each country. We interpret this as evidence that respondents indeed estimate their EU position with reference to their national income position. The association is particularly strong for Germany and Sweden. The strong correlation holds in each country when additionally including the actual EU income position in the model (column 2). The coefficient of the actual EU income position is also notably smaller, which shows that the perceived national position is a much stronger predictor than the actual EU income position. The small coefficient for the actual EU income position also reflects the substantial amount of misperception of the EU position, already depicted in Figure 3 above. The coefficient of the perceived national position remains highly statistically significant and the size remains almost the same when further covariates are added to the model (column 3). Results are robust to excluding respondents who answered follow-up questions for income or the two income positions (Table B1).

<place table 3 about here>

The results in Table 3 provide indicative evidence that EU citizens use the perceived national income position as a reference point. However, these results do not exclude the possibility that respondents determine their EU position independently of their national position. Furthermore, they may not know their national nor their EU income position and simply transfer a random guess about their national position to the EU level. In both regards, the strong association between national and EU position would then simply be an artefact, produced by using the same question design for estimating both positions. We address this caveat with our pre-test data, collected in Germany three months before going into the field with the main survey. There, we implemented a ‘Question Order Treatment’ whereby a randomized half of the respondents was asked first about their national income position (National First group) and the other half first about their EU income position (EU First group).

Figure 4 shows that 36% of the respondents in the EU First group estimate exactly the same EU as national position. In contrast, respondents who were first asked about their national income position estimate by 21 percentage points less often the same position. This large difference is statistically significant at the 1%-level and robust to including further control variables (see results in Table A5). If it were true that the association obtained in Table 3 simply rests on the same question design or a random guess, we should not find any significant difference between the treatment groups. The fact that we do provides strong evidence against this caveat. Furthermore, the results indicate that respondents in the EU First group are more likely to be overburdened by the question on their EU position and simply opt for choosing equal positions. In turn, respondents who are first primed to think about their national position estimate less often the same EU as national position and thus tap significantly less often in the dark. This provides further evidence for our theoretical prediction that respondents, at least in Germany, orient themselves towards their national position when estimating their EU position, even if not solely.

<place figure 4 about here>

4.2 *Perceived Difference: EU vs. National Income Position*

We now investigate the prediction that the perceived country ranking drives the perceived difference between EU and national income positions. For this purpose, we measure a perception of the difference D between income positions by subtracting the perceived national income percentile from the perceived EU percentile (1) and compare it with the difference between actual positions (2):

$$D^{Perceived} = P_{EU}^{Perceived} - P_{National}^{Perceived} \quad (1)$$

$$D^{Actual} = P_{EU}^{Actual} - P_{National}^{Actual} \quad (2)$$

The actual difference D^{Actual} indicates the true ranking of the country within the EU. The more it deviates from $D^{Perceived}$, the less aware respondents are where they stand cross-nationally. A larger size of $D^{Perceived}$ denotes a larger difference between perceived EU and national income position. Naturally, deviations are possible in two directions: either respondents perceive a higher EU than national income position or they perceive a lower EU than national income position.

Figure 5 depicts the distribution of the perceived and actual difference between EU and national income positions. The dark gray box and whiskers in each country stand for the perceived difference, the box and whiskers in white for the actual difference. For Poland, the actual difference is minus 30 percentiles, illustrating that the median Polish respondent ranks 30 percentiles lower within the EU than nationally. In contrast, the actual difference for the median Italian respondent is plus one percentile, revealing that Italian respondents have a very similar position within the EU and in their country. The median German respondent ranks eight and the median Swedish respondent ranks 13 percentiles higher within the EU than nationally.

<place figure 5 about here>

Given the different ranking of their countries in the EU, respondents perceive the direction of the difference correctly, when they estimate (1) a lower EU than national position in Poland, (2) an EU position that is close to the national position in Italy, and (3) a higher EU than national position in Germany and Sweden. We find that 70% of German and 69% of Swedish respondents perceive the difference correctly and estimate a higher EU than national income position (they perceive a difference above zero in Figure 5). Furthermore, the median German and Swedish respondents both perceive the difference with ten percentiles quite close to the actual difference (eight percentiles in

Germany and 13 percentiles in Sweden). Similarly, 76% of Polish respondents perceive the direction of the difference correctly (they perceive a difference below zero in Figure 5). However, Polish respondents at the median greatly underestimate the actual difference with minus 15 percentiles. In contrast, only 35% of Italians perceive an EU position close to their national position, already allowing for a difference of up to plus/minus ten percentiles. In line with that, the median Italian respondent perceives with minus ten percentiles a much lower than actual difference (one percentile).

Overall, these findings reveal that respondents in Germany and Sweden have quite an accurate understanding of the difference between their EU and national income position; Germany even more so than Sweden in view of the dispersion. In Poland, although a majority of respondents know their ranking vis-à-vis the EU, they still misperceive the size of the difference, revealing a more optimistic view of European convergence. In contrast, Italian respondents have a rather pessimistic view of their standing within the EU, since they greatly misperceive both the direction and the size of the difference.

In a next step, we investigate if the in large part correct perception of the difference in Poland, Germany, and Sweden is in line with their perceived country ranking. This might also shed more light on the diverging finding for Italy. Therefore, we test particularly if the perceived difference of Italian respondents is more consistent with how they rank their country against EU average, rather than Italy's actual ranking. An Italian respondent, who ranks her country lower than the EU average, perceives the difference consistently with her country ranking as long as she also estimates her individual EU income position to be lower than her national position.

Table 4 confirms the importance of the perceived country ranking for the perceived difference between EU and national income position. We colored the correct country ranking in each country in gray, that is, for Poland lower than the EU average, for Italy close to, and for Germany and Sweden higher than the EU average. Looking first at Italy in the second row, we find that only 14% of Italian respondents rank their country correctly close to the EU average. A majority (of 78%) rank their country incorrectly lower than the EU average. However, of those, more than two thirds (0.71) perceive the

difference consistently with this country ranking. Furthermore, the share of respondents perceiving a lower (higher) EU than national income position decreases (increases) for respondents who rank their country close to the EU average or higher than the EU average. These findings provide strong evidence that Italians align their estimates of the difference between EU and national income positions with their perceived country ranking. Therefore, although they are likely to have incomplete information about their country's income distribution and their country's actual ranking against the EU average, they are capable of correctly inferring the relationship between the EU and national income position from their perceived country ranking.

<place table 4 about here>

A majority of respondents in Poland (64%), Germany (76%), and Sweden (59%) rank their country correctly and among those, we find a high consistency between perceived country rank and perceived difference. The shares of those perceiving a correct difference in Germany and Sweden – a higher EU than national income position – is smaller among respondents, who incorrectly rank their country lower than or close to the EU average. For Poland, the share of respondents perceiving a correct difference - a lower EU than national income position - is smaller among those who incorrectly rank their country higher than the EU average.

Furthermore, in all four countries, respondents who rank their country differently than the majority - in Poland and Italy close to or higher and in Germany and Sweden close to or lower than the EU average - perceive a difference that is inconsistent with this country ranking. The inconsistency is particularly large among respondents who rank their country close to EU average and it remains large, even when we allow for a tolerance corridor for the perceived difference of up to 20 percentiles (see Table A6). Lastly, multivariate results in Table A7 confirm that in each country respondents' perceptions of the difference vary statistically significantly depending on their perceived country rank-

ing. These results are for the most part robust to excluding respondents who answered follow-up questions for income or the two income positions (Table B2).

To sum up, findings from this section provide strong evidence that a majority of respondents in Poland, Germany and Sweden are aware of where their country ranks within the EU. Most Italians, in turn, rank Italy lower than EU, revealing a too pessimistic view about their country. In each country, respondents align to a large part their perceived difference between their EU and national income position with their perceived country ranking.

4.3 *EU Income Misperceptions*

In this section, we analyze the formation of EU income misperceptions. Following Cruces et al. (2013), we define a misperception M of one's income position P by subtracting the actual income percentile from the perceived income percentile, where M_{EU}^P (3) measures misperceptions at the EU level and $M_{National}^P$ (4) measures misperceptions at the national level:

$$M_{EU}^P = P_{EU}^{Perceived} - P_{EU}^{Actual} \quad (3)$$

$$M_{National}^P = P_{National}^{Perceived} - P_{National}^{Actual} \quad (4)$$

Figure 6 depicts misperceptions of EU and national income positions by actual national income deciles. Dark gray bars refer to misperceptions with regard to the EU income distribution, white bars with regard to the national income distribution. Whenever the dark gray bars are longer than the white bars, the line within the bar depicts the height of the latter. The directions of the national income misperceptions reveal in all countries a similar pattern as found in previous studies (e.g. Cruces et al., 2013; Karadja et al., 2017; Engelhardt and Wagener, 2018; Bublitz, 2020): Respondents in the lower income deciles tend to overestimate their income position, while those in the higher deciles tend to underestimate it. Furthermore, national income misperceptions

are largest at both ends of the distribution. One must be aware that size and direction of misperceptions are limited by simple ‘mechanics’. That is, respondents in the lowest national income decile can hardly underestimate their position whereas respondents in the highest decile can hardly overestimate it. We also took account of a possible center bias that may result from the design of the question, as argued by Hvidberg, Kreiner, and Stantcheva (2020). Figure A4 in the appendix reveals that this re-ranking reduces the size of misperception, particularly for the higher deciles, but the approximate S-shape of income misperceptions depicted in Figure 6 holds.

<place figure 6 about here>

The main result of Figure 6 is that we find the typical S-shape of national income misperceptions also at the EU level (dark gray bars). In Germany and Sweden, size and direction of EU and national income misperceptions are very similar. In section 4.1, we showed that respondents estimate their EU position with reference to their national position. Having this result in mind, the similar pattern in Figure 6 provides strong evidence for the mechanism at play according to which respondents transfer incorrect information about their national income position to the EU level. Furthermore, section 4.2 showed that respondents in all countries but Italy perceive the difference between EU and national income positions correctly. The correctly perceived difference explains why respondents in Germany and Sweden exhibit a very similar size in their income misperceptions at EU and national level. The similarity also holds for the direction of misperceptions, as depicted more closely in Figure 7. Very similar shares of German and Swedish respondents underestimate, overestimate and perceive their national as well as their EU income position correctly.

The large share of respondents in Italy who misperceive their country ranking may explain the larger deviations of income misperceptions. A great majority of Italians, consistent with their country ranking, estimate a lower EU than national income position

although Italy is actually close to EU average (see results in section 4.2). Therefore, respondents who overestimate their national income position (who are above zero in Figure 6) will estimate an EU income position that is closer to their actual position, while respondents who underestimate it will estimate a position that is even farther away. For that reason, we see in Figure 7 much more (less) respondents in Italy who underestimate (overestimate) their EU instead of national position.

<place figure 7 about here>

The pattern behind the larger deviations for Poland, in turn, is close to mechanical: The axis label at top of each plot in Figure 6 indicates the average actual income position within the EU for the first, fifth, and tenth national income decile. Since Poland ranks lower than EU average, Polish respondents in the fifth national income decile are on average in the 20th percentile within the EU. Figure 3, in turn, showed that both perceived and actual EU income distributions in Poland have the similar right-skewed shape. Therefore, it is much more likely for Polish respondents to estimate their EU income position correctly, since 88% are actually positioned in the first to fifth actual income decile within the EU and 86% of respondents position themselves within it. Consequently, Figure 7 depicts a larger share of Polish respondents who estimate their EU rather than their national position correctly.

Overall, we find that respondents form their EU income misperceptions in Poland, Germany, Italy, and Sweden by transferring an incorrectly perceived national position to the EU level. In Italy, EU misperceptions additionally stem from an incorrect country ranking, resulting in smaller EU than national income misperceptions among respondents who overestimate their national position and larger EU than national misperceptions among respondents who underestimate their national position.

5 A Lasting Treatment Effect on Perceived Income Positions

At first sight, the EU income position may seem too detached from the respondents' lives. In this section, we aim to understand if and to what extent respondents find their estimated EU income position and its difference to their national position meaningful.

In a first step, we analyze the persistence of misperceptions between the main and follow-up survey in Germany for respondents who did not receive any information (control group). Figure 8 depicts strong correlations of misperceptions of EU and national income positions between the main and the follow-up survey (Spearman's rho is 0.69 for EU and 0.76 for national income misperceptions). The strong correlations show that estimates of national and EU income positions are not the result of random guesses; otherwise, we should obtain substantially smaller correlations. This finding indicates that respondents find their income positions meaningful enough to report a very similar income position three months later. It also provides further evidence that respondents do not seem to be overburdened when asked about their income positions both at national and the EU level.

<place figure 8 about here>

In a next step, we analyze if the treatments in the main survey had a lasting effect on the perceptions in the follow-up survey. The Single treatment informed one third of the respondents about their actual EU income position. The Double treatment informed another third of the respondents additionally about their national income position. Compared to respondents in the control group, we test if German respondents in the Single or Double treatment group improve their guesses on their EU position and on the difference between their EU and national income position three months later.

The first two columns in Table 5 summarize the results of regressing the absolute value

of the EU income misperception on the Single and Double treatment (reference: control group) and additional control variables (actual income position, national identity, education, age, number of children, employment status, and COVID-19 affectedness). Results in column 1 show that respondents in the Single treatment group significantly reduce their EU misperception by around 5.2 percentiles in the follow-up survey. This corresponds to a predicted decrease of 22% compared to the control group (mean of around 23.8 percentiles). Respondents in the Double treatment group also significantly reduce their EU misperception by 4.1 percentiles. Results in column 2 confirm the robustness of the treatment effects when including control variables.

The second two columns show results on whether respondents in the treatment groups are more likely to estimate a correct EU income position in the follow-up survey. We allow here for a tolerance corridor of up to 20 percentiles, that is, respondents have a correct perception as long as the deviation in either direction does not exceed 10 percentiles. Column 3 shows that respondents in the Single treatment group are by approximately 13.2 percentage points more likely to estimate a correct EU income position. This corresponds to a predicted increase in correct perceptions of around 52% compared to the share of correct respondents in the control group (25.2%). The effect of the Double treatment stands at approximately 12.2 percentage points and is therefore similarly high. The results are robust to including control variables (column 4).

Lastly, we test if more respondents in the treatment groups perceive the difference between their national and cross-national income positions correctly. Column 5 and 6 show that respondents are not significantly more likely to perceive a higher EU than national income position in either the Single or the Double treatment group. Consistent with this finding, these respondents are also not more likely to rank their country higher than EU average (column 7 and 8). Therefore, although respondents react to the treatments by updating their beliefs on their actual income positions, they do not change their beliefs on how their country stands within the EU. One possible interpretation is that respondents process mainly information in the treatment about their own income position and not the difference between their national and EU income position. The results are robust to

excluding respondents who answered follow-up questions for income or the two income positions (see Table B3).

<place table 5 about here>

We also test if the treatment had any impact on respondent's national income perceptions. Results in Table A8 show that respondents in both treatment groups also reduce the size of their national income misperception. Interestingly, informing respondents only about the EU position also significantly reduces their national income misperception by 3 percentiles. This corresponds to a reduction of around 10% compared to the control group (mean of 28.7 percentiles). It suggests that respondents are able to transfer information about their EU income misperception to the national level. However, results for the Single treatment effect on national income perceptions are less robust, as shown in Table B4. So, the findings should be taken with caution. Lastly, respondents in neither the Single nor the Double treatment group are significantly more likely to estimate a correct national income position. Thus, while they reduce the size of their misperception, the treatments did not increase the share of respondents who perceive their national income position correctly.

The long-run treatment analysis shows that providing respondents with information on where they stand has a lasting impact on EU income perceptions. This indicates that respondents were able to process the information and that they were not overburdened by it. Overall, the experimental results provide evidence that the income position within the EU is meaningful to some respondents. Otherwise, we should not have found significant differences between control and treatment groups: Respondents in the treatment groups would not have learned from the information treatment and reported corrected estimates three months later. As in the previous sections, our findings give thus reason to believe that EU citizens associate themselves not only with their national surroundings but also with the supranational order of the European Union.

6 Conclusion

This paper is the first to explore how EU citizens place themselves within the EU based on their income and how that relates to perceptions. We conducted online surveys in the four EU member states Germany, Italy, Poland, and Sweden. These included a randomized experiment that informed respondents about their actual EU and national income position. A pre-test took place three months earlier and a follow-up survey three months later in Germany. We assumed that respondents would base their income perceptions within the EU (1) on how they position themselves in their country and (2) on their perceived country ranking against the EU average.

We find strong evidence for our theoretical assumptions: The respondents' perceptions are similar for their EU and their national income position. A majority bases their guesses of the difference between both positions on where they rank their country compared to the rest of the EU. Furthermore, German respondents who were informed about their actual income position are more likely to estimate a correct EU income position three months later and the size of their misperception decreases. We interpret these findings as evidence that EU citizens are aware of where they stand within the EU and of the inequalities associated with the different economic backgrounds of their countries.

We believe there exist at least three promising directions for future research: First, our study shows that even for personal comparisons at the supranational level, the individuals' living contexts matter tremendously. Although we analyzed how the perception of the own country relates to the perception of the personal position, we still know very little about the origins of country perceptions. For this endeavor, a battery of questions would be necessary, which our study could not include. Second, one may explore if our findings can be reproduced in different (non-Western) social contexts with a supra-national union like the EU, such as the Union of South American Nations or the African Union. Third, as a follow-up to this study it would be worth investigating how income misperceptions at the EU level affect preferences towards social policies that target inequalities within the EU.

Funding

This article presents independent research that was funded by the Federal Ministry of Labour and Social Affairs in Germany.

References

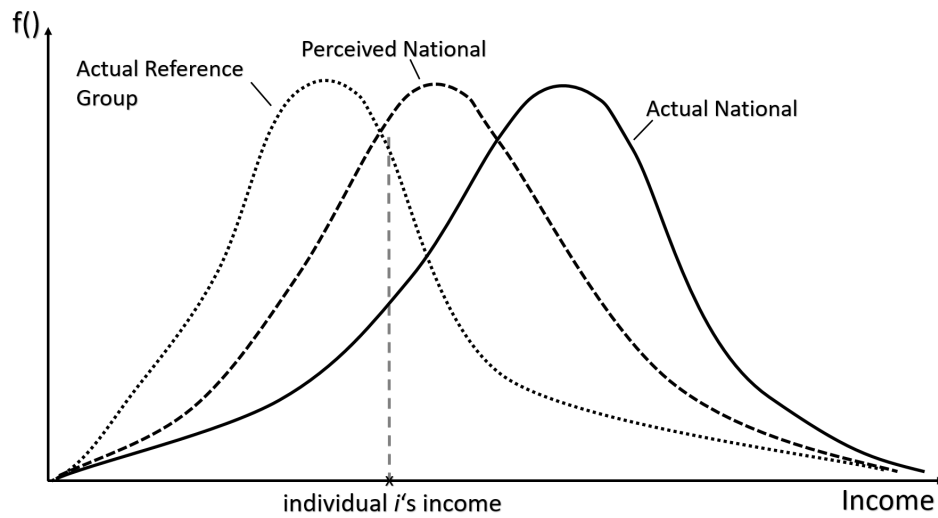
- Alesina, A., Stantcheva, S., Teso, E. (2018). Intergenerational mobility and preferences for redistribution. *American Economic Review*, 108(2), 521-54. 10.1257/aer.20162015
- Bublitz, E. (2020). Misperceptions of income distributions: cross-country evidence from a randomized survey experiment. *Socio-Economic Review*, 0(0), 1-28. 10.1093/ser/mwaa025
- Bussolo, M., Ferrer-i-Carbonell, A., Giolbas, A., Torre, I. (2021). I perceive therefore I demand: The formation of inequality perceptions and demand for redistribution. *Review of Income and Wealth*, 67(4), 835-871. 10.1111/roiw.12497
- Ciani, E., Fréget, L., & Manfredi, T. (2021). Learning about inequality and demand for redistribution: A meta-analysis of in-survey informational experiments. *OECD Papers on Well-being and Inequalities*, 2, OECD Publishing, Paris. 10.1787/8876ec48-en
- Cruces, G., Perez-Truglia, R., & Tetaz, M. (2013). Biased perceptions of income distribution and preferences for redistribution: Evidence from a survey experiment. *Journal of Public Economics*, 98, 100-112. 10.1016/j.jpubeco.2012.10.009
- Delhey, J., & Kohler, U (2006). From nationally bounded to Pan-European inequalities? On the importance of foreign countries as reference groups. *European Sociological Review*, 22(2), 125-140. 10.1093/esr/jci047
- Engelhardt, C., & Wagener, A. (2018). What do Germans think and know about income inequality? A survey experiment. *Socio-Economic Review*, 16(4), 743-767. 10.1093/ser/mwx036
- Fahey, T. (2007). The Case for an EU-wide Measure of Poverty. *European Sociological*

- Review, 23(1), 35-47. 10.1093/esr/jcl018
- Fernández-Albertos, J., Kuo, A. (2018). Income perception, information, and progressive taxation: Evidence from a survey experiment. *Political Science Research and Methods*, 6(1), 83-110. 10.1017/psrm.2015.73
- Fehr, D., Mollerstrom, J., & Perez-Truglia, R. (2019). Your place in the world: The demand for national and global redistribution. NBER Working Paper, 26555, National Bureau of Economic Research.
- Gimpelson, V., Treisman, D. (2018). Misperceiving inequality. *Economics Politics*, 30(1), 27-54. 10.1111/ecpo.12103
- Hauser, O. P., Norton, M. I. (2017). (Mis)perceptions of inequality. *Current Opinion in Psychology*, 18, 21-25. 10.1016/j.copsyc.2017.07.024
- Hoy, C., Mager, F. (2021). Why are relatively poor people not more supportive of redistribution? Evidence from a randomized survey experiment across ten countries. *American Economic Journal: Economic Policy*, 13(4), 299-328. 10.1257/pol.20190276
- Hvidberg, K. B., Kreiner, C., & Stantcheva, S. (2020). Social position and fairness views. NBER Working Paper, 28099, National Bureau of Economic Research.
- Hyman, H. H., & Singer, E. (Eds.). (1968). *Readings in reference group theory and research*. New York: Free Press.
- Kahneman, D., Slovic, P., & Tversky, A. (Eds.). (1982). *Judgment under uncertainty: Heuristics and biases*. Cambridge: Cambridge University Press.
- Karadja, M., Mollerstrom, J., & Seim, D. (2017). Richer (and holier) than thou? The effect of relative income improvements on demand for redistribution. *Review of Economics and Statistics*, 99(2), 201-212. 10.1162/REST_a00623
- Kuziemko, I., Norton, M. I., Saez, E., Stantcheva, S. (2015). How elastic are preferences for redistribution? Evidence from randomized survey experiments. *American Economic Review*, 105(4), 1478-1508. 10.1257/aer.20130360
- Lahusen, C., & Kiess, J. (2019). 'Subjective Europeanization': do inner-European comparisons affect life satisfaction?. *European Societies*, 21(2), 214-236. 10.1080/14616696.2018.1438638

- Lergetporer, P., Werner, K., Woessmann, L. (2020). Educational inequality and public policy preferences: Evidence from representative survey experiments. *Journal of Public Economics*, 188, 104226. 10.1016/j.jpubeco.2020.104226
- Merton, R. K. (1957). *Social theory and social structure*. New York: Free Press.
- Norton, M. I., & Ariely, D. (2011). ‘Building a Better America — One Wealth Quintile at a Time’. *Perspectives on Psychological Science*, 6(1), 9–12. doi: 10.1177/1745691610393524
- Osberg, L., Smeeding, T. (2006). “Fair” inequality? Attitudes toward pay differentials: The United States in comparative perspective. *American sociological review*, 71(3), 450-473. 10.1177/000312240607100305
- Trump, K. S. (2018). Income inequality influences perceptions of legitimate income differences. *British Journal of Political Science*, 48(4), 929-952. 10.1017/S0007123416000326
- Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases: Biases in judgments reveal some heuristics of thinking under uncertainty. *Science*, 185(4157), 1124-1131. 10.1126/science.185.4157.1124
- Whelan, C. T., & Maître, B. (2009). Europeanization of inequality and European reference groups. *Journal of European Social Policy*, 19(2), 117-130. 10.1177/0958928708101865

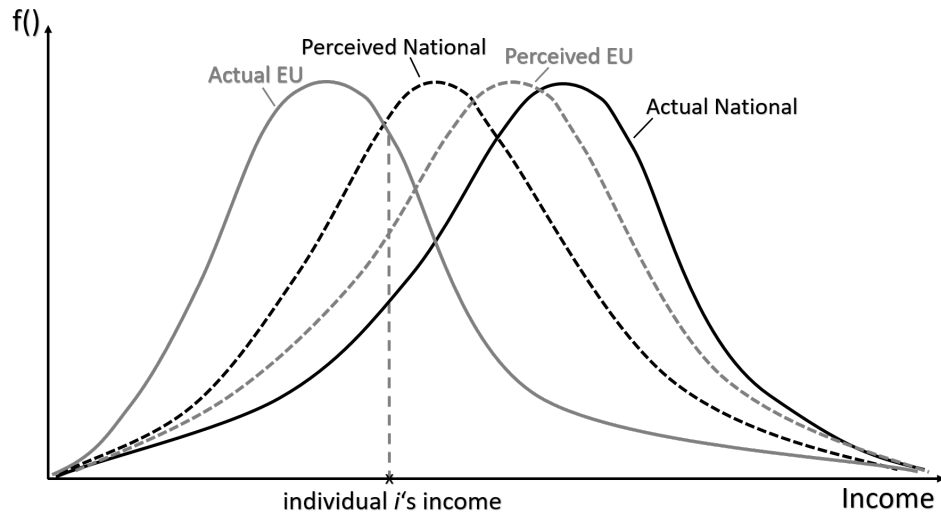
Figures and Tables

Figure 1: Perceived and Actual National Income Distribution



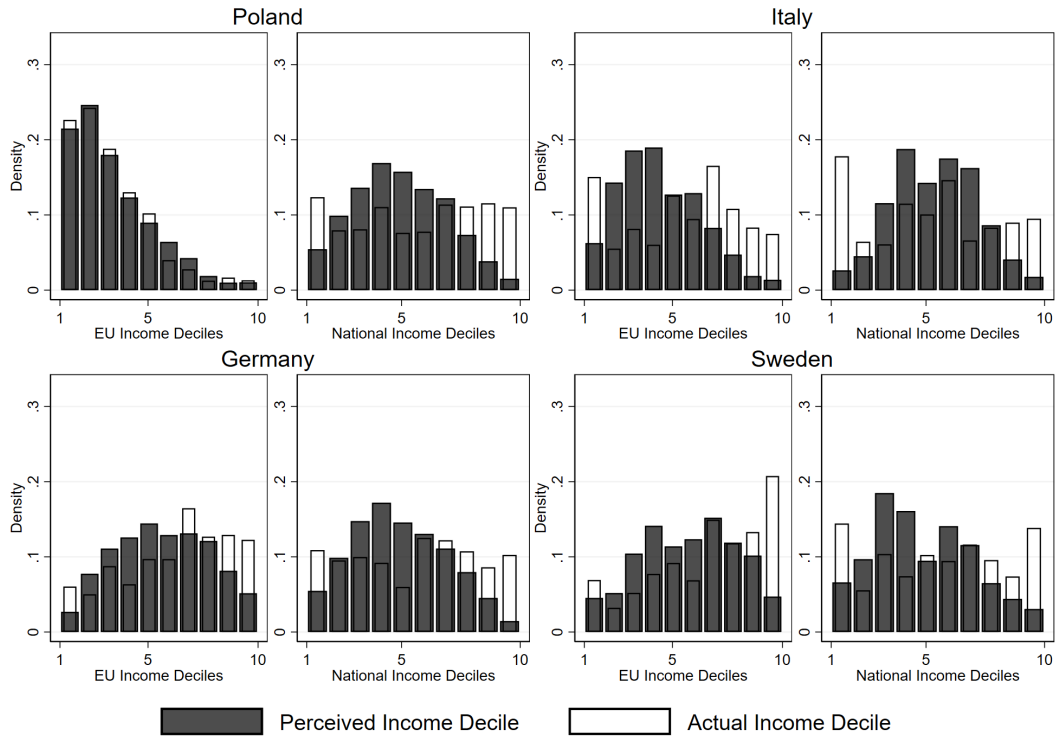
Notes: The figure displays the formation of national income perceptions based on reference group theory. 'Actual Reference Group' denotes the income distribution of individual i 's neighborhood, 'Actual National' the income distribution of individual i 's country, and 'Perceived National' individual i 's perceived national income distribution.

Figure 2: Perceived and Actual EU Income Distribution



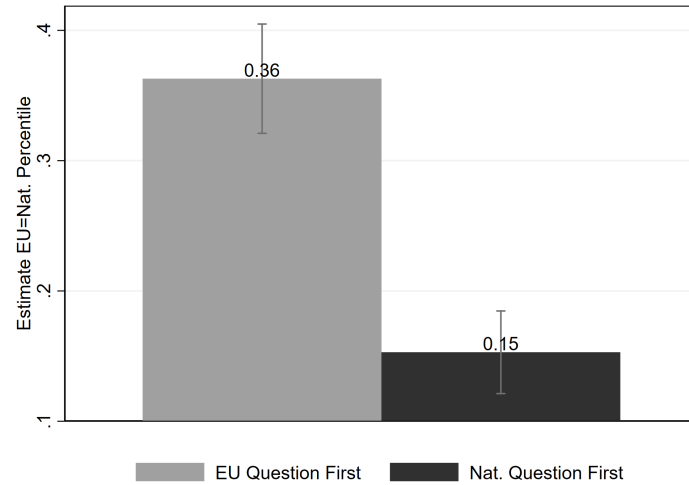
Notes: The figure displays the formation of EU income perceptions based on reference group theory. 'Actual EU' denotes the income distribution of the EU, 'Actual National' the income distribution of individual i 's country, 'Perceived EU' individual i 's perceived EU income distribution, and 'Perceived National' individual i 's perceived national income distribution.

Figure 3: Perceived and Actual Income Positions



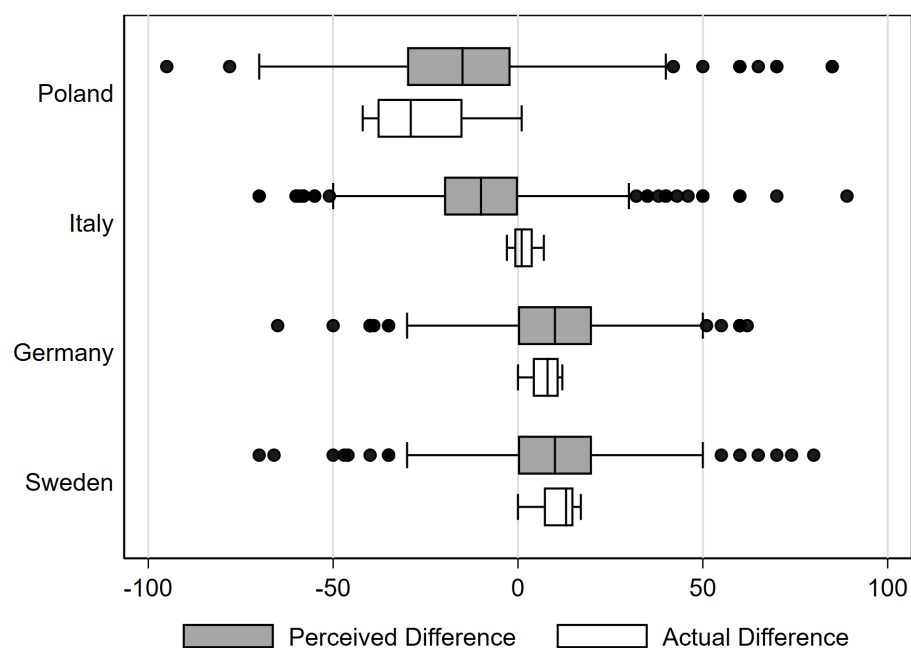
Notes: The figure displays the distribution of perceived and actual income positions (in deciles) at EU and national level for each country. Survey weights are applied.

Figure 4: Question Order Treatment Effects for German Respondents in the Pre-test



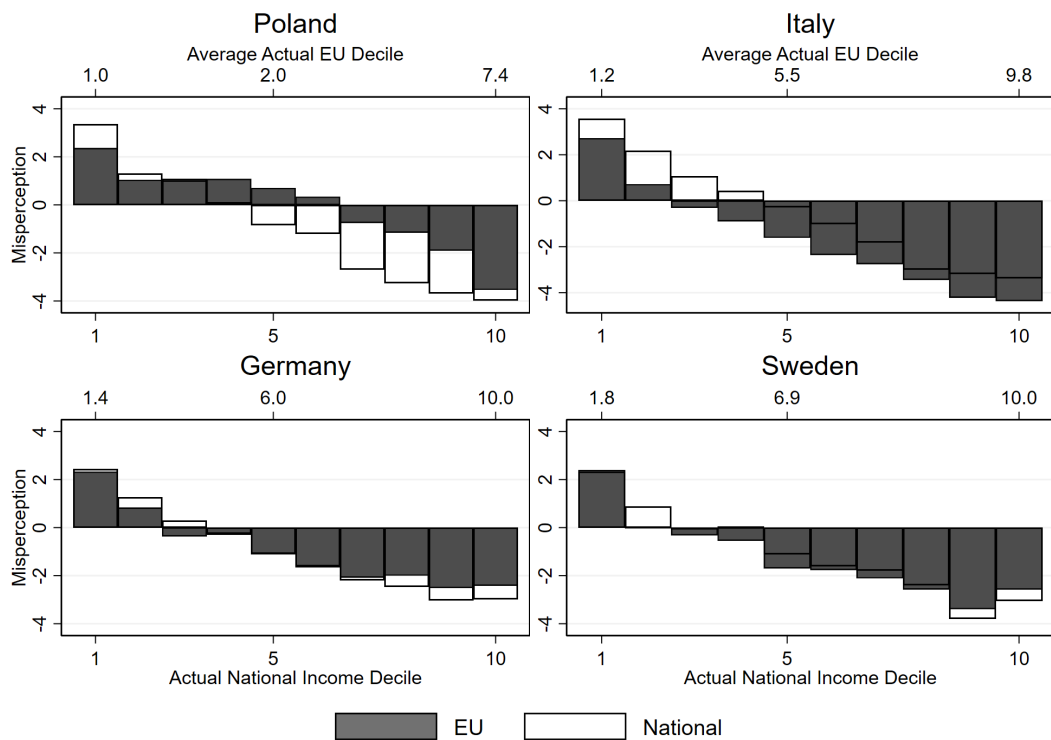
Notes: The figure displays the share of German respondents in the pre-test who estimate the same income percentile at national and EU level. Respondents in the *EU Question First* group were first asked about their EU income position. Respondents in the *Nat. Question First* group were first asked about their national income position. 95% confidence intervals added.

Figure 5: Perceived and Actual Differences between EU and National Income Position



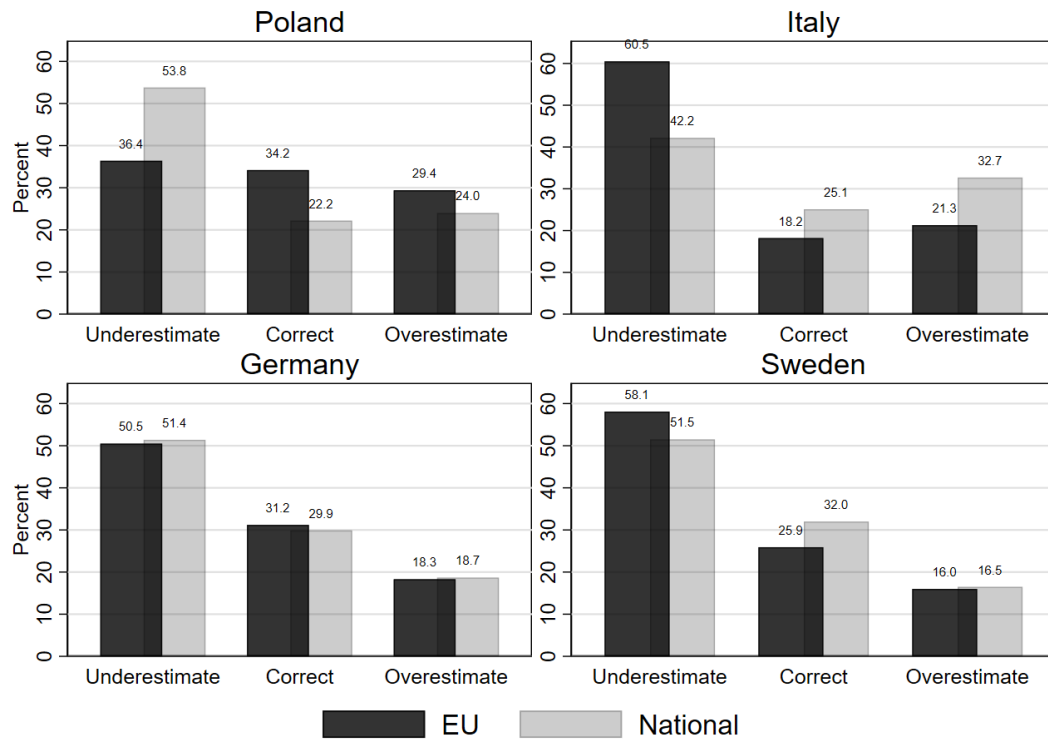
Notes: The figure displays boxplots of the perceived and actual difference between the EU and national income position for each country. Survey weights are applied.

Figure 6: Misperceptions of EU and National Income Positions



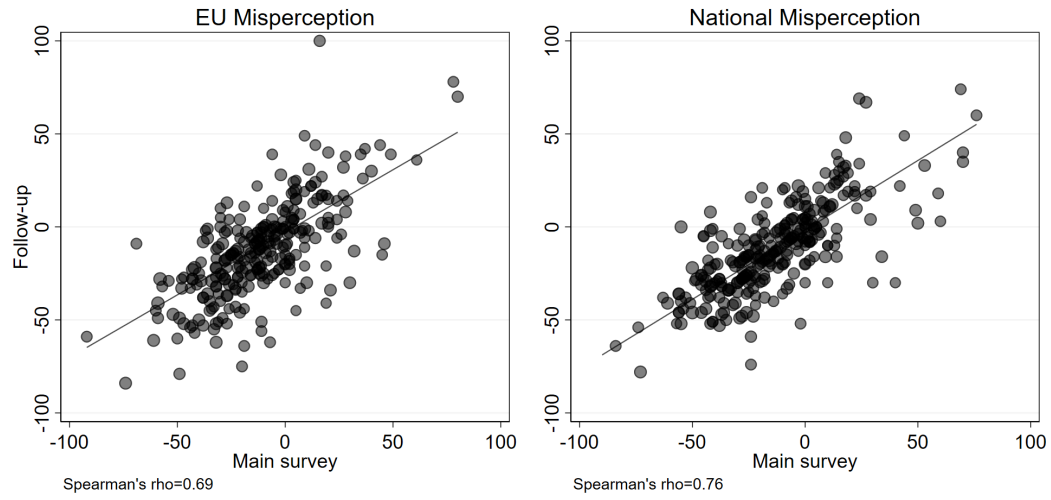
Notes: The figure displays the average EU and national income misperception by the actual national income decile for each country. A misperception is defined as the perceived minus the actual income percentile. Survey weights applied.

Figure 7: EU and National Misperception Groups



Notes: The figure displays the distribution of EU and national income misperception groups for each country. Respondents may underestimate their position (perceived minus actual position below zero), overestimate their position (perceived minus actual position above zero), or perceive a correct position (the difference between perceived and actual position is 10 percentage points or less). Survey weights are applied.

Figure 8: Persistence of Misperceptions in the Control Group



Notes: The figure displays scatterplots showing the persistence in EU income misperceptions (left panel) and national income misperceptions (right panel) between the main survey and the follow-up survey (three months later) for German respondents in the control group. Survey weights are applied.

Table 1: Country Characteristics

	Accession to EU	Equiv. Net HH Income	Gini Coefficient	Unemployment Rate	Social Expenditure
Poland	2004	7142	28.5	3.3	19.7
Italy	1993	17165	32.8	9.9	28.8
Germany	1993	23504	29.7	3.0	29.8
Sweden	1995	24490	27.6	7.0	28.2
EU-28		17858	30.8	6.3	27.6

Notes: Data source is Eurostat. The table shows the year of accession to the EU (column 1), the median equivalized net household income in Euro in 2019 (column 2, indicator: ilcdi04), the Gini coefficient of median equivalized net household income in 2019 (column 3, indicator: tessi190), the unemployment rate in 2019 (column 4, indicator: tps00203), and social protection benefits in % of GDP in 2018 (column 5, indicator: tps00098) for each country in the sample and the EU (including UK).

Table 2: Descriptive Statistics of the Main Survey

	Min	Max	Poland		Italy		Germany		Sweden	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD
Actual Nat. Position	0	99	50.75	30.49	46.88	30.41	49.94	29.19	50.12	30.17
Actual EU Position	0	99	25.62	20.64	48.16	28.76	57.40	26.91	60.91	28.27
Perceived Nat. Position	0	100	40.05	21.60	44.24	19.95	40.18	21.70	39.89	23.22
Perceived EU Position	0	100	23.96	19.90	34.59	20.45	48.05	23.41	49.26	23.86
Rank: Country<EU	0	1	0.64	0.48	0.78	0.42	0.08	0.27	0.18	0.38
Rank: Country=EU	0	1	0.12	0.33	0.15	0.35	0.16	0.37	0.23	0.42
Rank: Country>EU	0	1	0.24	0.42	0.08	0.27	0.76	0.43	0.59	0.49
National Identity	0	1	0.20	0.40	0.35	0.48	0.27	0.44	0.45	0.50
Female	0	1	0.50	0.50	0.50	0.50	0.47	0.50	0.46	0.50
Low Education	0	1	0.17	0.37	0.46	0.50	0.18	0.39	0.20	0.40
Medium Education	0	1	0.61	0.49	0.40	0.49	0.53	0.50	0.49	0.50
High Education	0	1	0.22	0.42	0.14	0.35	0.29	0.45	0.31	0.46
Age	18	92	44.62	15.84	48.31	15.19	49.74	15.87	51.45	17.56
Number of Children	0	9	1.39	1.27	1.18	1.14	1.12	1.21	1.39	1.33
Working	0	1	0.58	0.49	0.51	0.50	0.55	0.50	0.49	0.50
In Education	0	1	0.06	0.24	0.09	0.29	0.06	0.23	0.07	0.25
Unemployed	0	1	0.04	0.19	0.11	0.31	0.03	0.17	0.06	0.25
Retired	0	1	0.21	0.41	0.16	0.37	0.30	0.46	0.33	0.47
Other	0	1	0.12	0.32	0.13	0.34	0.07	0.25	0.05	0.21
COVID-19 Affectedness	0	1	0.05	0.23	0.12	0.33	0.09	0.29	0.14	0.35

Notes: The table includes data for Poland (N=1008), Italy (N=909), Germany (N=1003), and Sweden (N=1063). Survey weights are applied.

Table 3: Determinants of the Perceived EU Income Position

	Dependent variable: Perceived EU Percentile					
	Poland			Italy		
	(1)	(2)	(3)	(1)	(2)	(3)
Perceived Nat. Percentile	0.437*** (0.029)	0.438*** (0.032)	0.433*** (0.031)	0.590*** (0.038)	0.565*** (0.041)	0.562*** (0.041)
Actual EU Percentile		-0.006 (0.034)	0.008 (0.034)		0.053** (0.026)	0.053* (0.028)
Constant	6.476*** (1.128)	6.557*** (1.200)	23.682*** (5.929)	8.469*** (1.762)	7.021*** (1.753)	18.201*** (6.893)
Controls			Yes			Yes
Observations	1008	1008	1008	909	909	909
R^2	0.225	0.225	0.248	0.332	0.337	0.346
	Germany			Sweden		
	(1)	(2)	(3)	(1)	(2)	(3)
Perceived Nat. Percentile	0.835*** (0.020)	0.744*** (0.027)	0.738*** (0.028)	0.801*** (0.024)	0.749*** (0.028)	0.749*** (0.030)
Actual EU Percentile		0.144*** (0.024)	0.133*** (0.024)		0.090*** (0.022)	0.083*** (0.022)
Constant	14.486*** (0.926)	9.904*** (1.085)	16.961*** (5.596)	17.301*** (1.153)	13.912*** (1.288)	20.659*** (6.193)
Controls			Yes			Yes
Observations	1003	1003	1003	1063	1063	1063
R^2	0.599	0.620	0.626	0.608	0.616	0.633

Notes: Coefficients and robust standard errors (in parentheses) from OLS regressions with survey weights applied. Dependent variable is the perceived EU income percentile. Independent variables are the perceived national income percentile and the actual EU income percentile. Control variables are National Identity, Gender, Education, Age, Age², Number of Children, Employment Status, Surroundings infected with COVID-19. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Perceived Difference - EU and National Position - by Perceived Country Rank

Country	Own Country perceived to rank...	Perceived Difference		
		EU<Nat	EU=Nat	EU>Nat
Poland	...lower than EU average (64%)	0.80	0.09	0.11
	...close to EU average (12%)	0.79	0.08	0.13
	...higher than EU average (24%)	0.62	0.11	0.27
Italy	...lower than EU average (78%)	0.71	0.13	0.16
	...close to EU average (14%)	0.52	0.20	0.28
	...higher than EU average (8%)	0.50	0.17	0.33
Germany	...lower than EU average (8%)	0.37	0.22	0.41
	...close to EU average (16%)	0.30	0.15	0.55
	...higher than EU average (76%)	0.15	0.11	0.74
Sweden	...lower than EU average (18%)	0.34	0.17	0.49
	...close to EU average (23%)	0.19	0.16	0.65
	...higher than EU average (59%)	0.12	0.10	0.78

Notes: The table displays the perceived difference between the EU and national income position of respondents who estimate a lower (EU<Nat), the same (EU=Nat) or a higher EU than national position (EU>Nat) by respondents' perceived country ranking. Highlighted in gray are the respondents who rank their country correctly against the EU average. In bold are shown the majority groups within each country (e.g. 64% of respondents in Poland rank their country lower than EU average and of those 80% estimate their own income position in the EU as lower than their national position). Survey weights are applied.

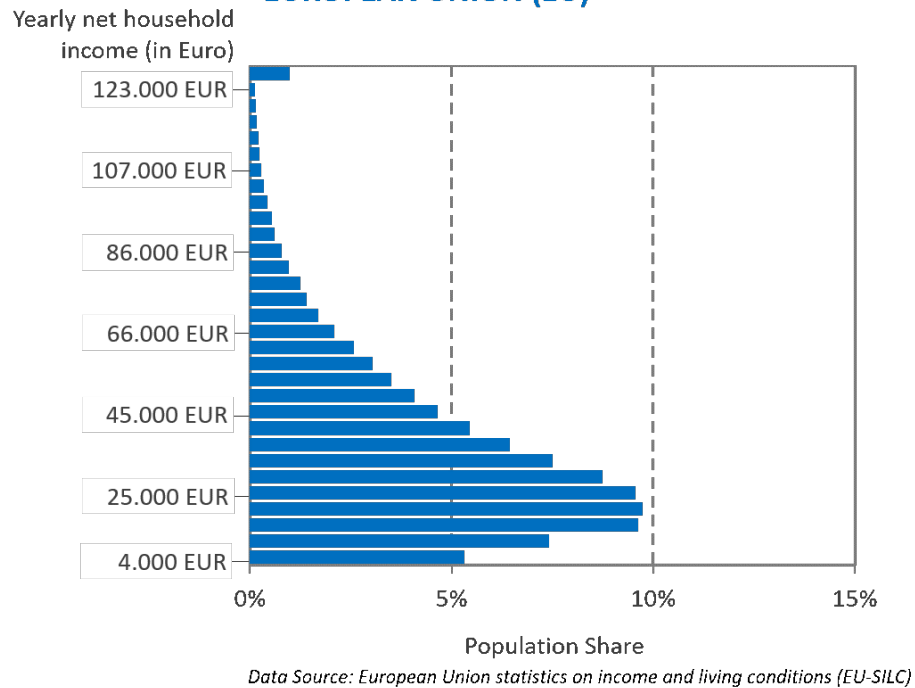
Table 5: Treatment Effects on Misperceptions Three Months Later in Germany

	Size Misperception		Correct Position		Correct Difference		Correct Rank	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Single Treatment	-5.172*** (1.479)	-4.920*** (1.432)	0.132*** (0.040)	0.122*** (0.039)	-0.038 (0.040)	-0.038 (0.040)	0.013 (0.033)	0.019 (0.032)
Double Treatment	-4.158*** (1.509)	-3.590** (1.460)	0.122*** (0.040)	0.111*** (0.039)	-0.002 (0.040)	-0.008 (0.040)	0.020 (0.033)	0.015 (0.031)
Constant	23.798*** (1.086)	20.576*** (7.918)	0.252*** (0.026)	0.514** (0.217)	0.712*** (0.028)	0.581*** (0.212)	0.777*** (0.024)	0.799*** (0.161)
Controls		Yes		Yes		Yes		Yes
Observations	814	814	814	814	802	802	923	923
R^2	0.017	0.121	0.016	0.082	0.001	0.027	0.000	0.103

Notes: Coefficients and robust standard errors (in parentheses) from OLS regressions with survey weights applied. Dependent variable in Model 1 and 2 is the size (absolute value) of the EU income misperception, in Model 3 and 4 the probability to estimate a correct EU position, in Model 5 and 6 the probability to perceive a higher EU than national income position, and in Model 7 and 8 the probability to rank the country higher than EU average. The *Single Treatment* informs about the EU Income Position; the *Double Treatment* additionally informs about the national income position. Reference are for both treatments respondents in the control group who did not receive any information. Control variables are the Actual National Income Position, National Identity, Gender, Education, Age, Age², Number of Children, Employment Status, Surroundings infected with COVID-19. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Online Appendix A

Figure A1: Single Treatment
Income Distribution in the
EUROPEAN UNION (EU)



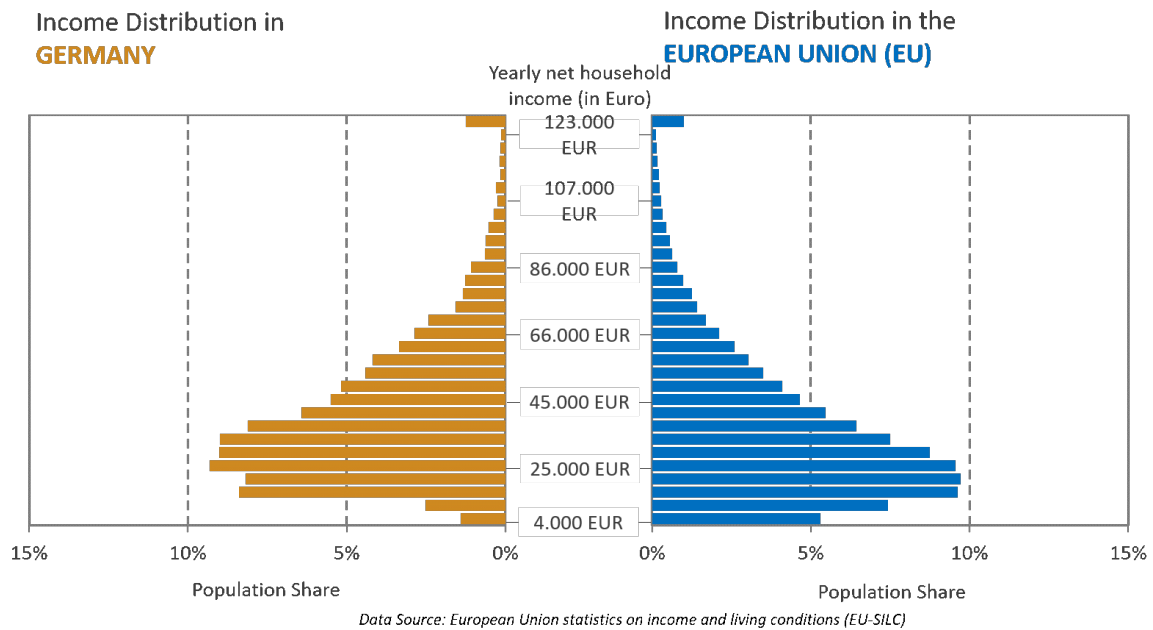
As a reminder: You indicated to have a yearly income of ____ Euro.

In the **EU**:

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

Notes: The Single treatment informs respondents about their actual income position within the EU.

Figure A2: Double Treatment - exemplary for Germany



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

In **Germany**:

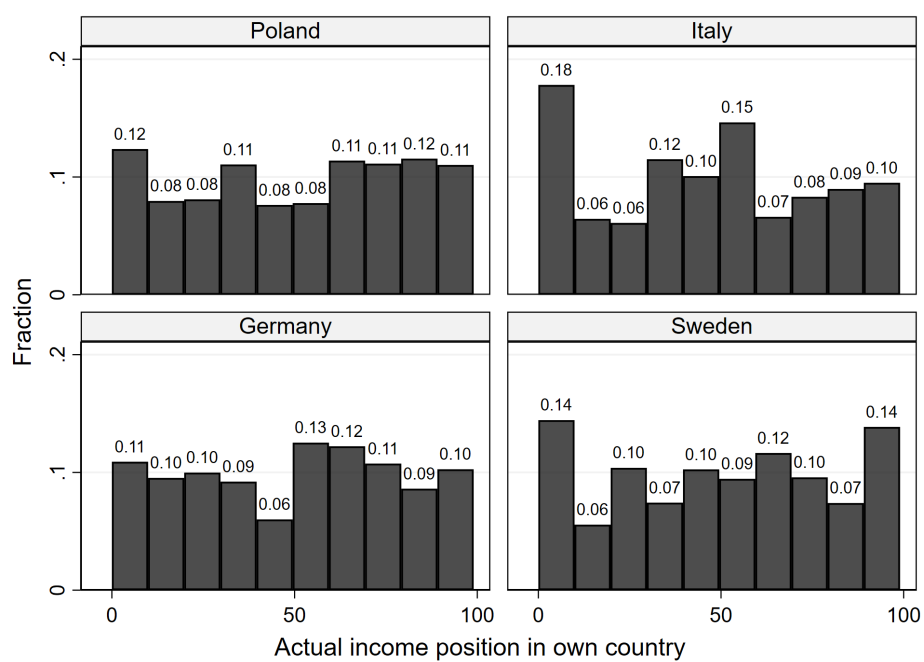
- ____ percent of households are poorer than you.
- ____ percent was your guess.

In the **EU**:

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

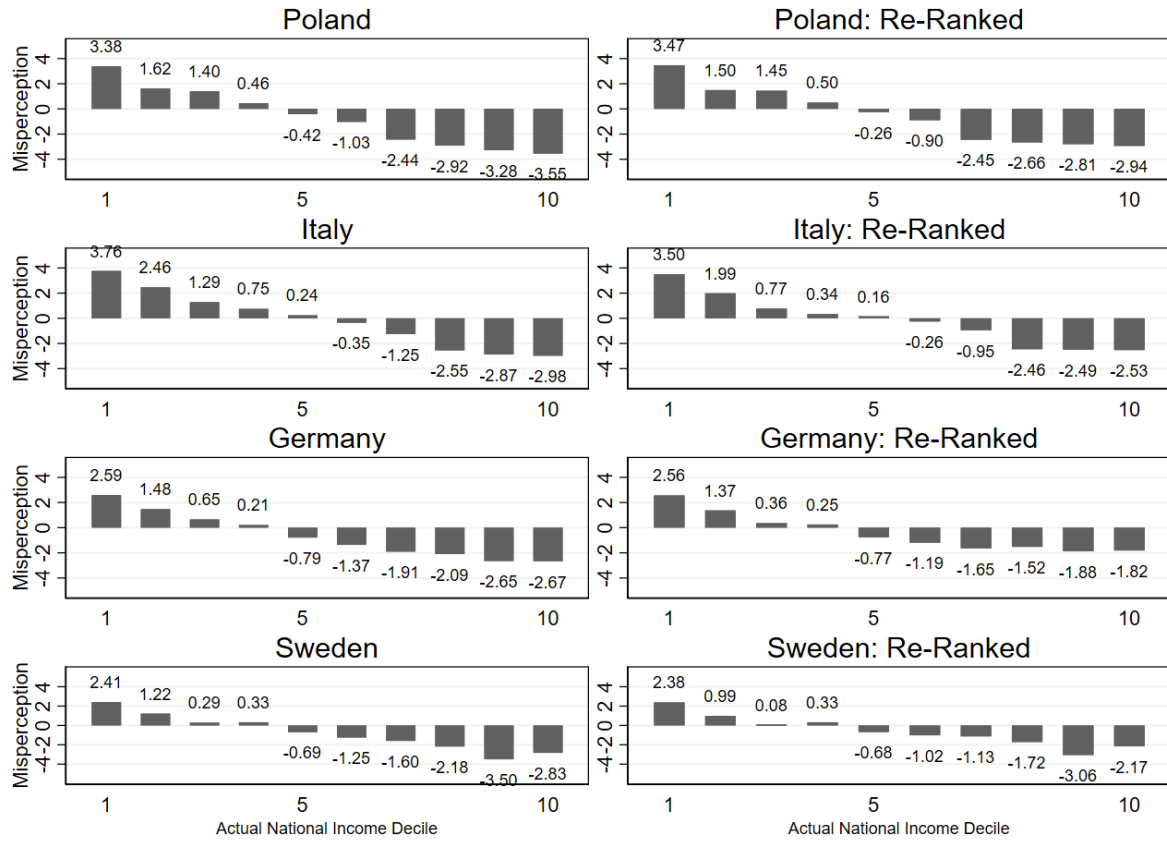
Notes: The Double treatment informs respondents about their actual income position within the EU and within their country.

Figure A3: Distribution of Actual National Income Positions



Notes: The figure displays the distribution of the actual national income position (in deciles) for each country. Survey weights are applied.

Figure A4: Re-Ranked Misperceptions of National Income Positions



Notes: The figure displays the average national income misperception by the actual national income decile for each country. The left panel depicts average national income misperceptions directly obtained from the sample. The right panel depicts re-ranked average national income misperceptions, where the perceived national income positions were first re-ranked, such that they are approximately uniformly distributed across 1-10 deciles, and then misperceptions were calculated by subtracting the actual income decile from the re-ranked perceived decile. Survey weights are applied.

Table A1: Income Type of Household by Respondent's Employment Status

	Employment Status	Income Type (in %)					N
		Employment	Retirement/ Pensions	Social benefits	Financial assistance	Capital	
Poland	Working	96.14	14.85	16.54	5.43	7.58	836
	Education	87.05	30.40	34.11	19.84	15.81	110
	Unemployed	65.72	8.85	39.38	12.66	2.96	87
	Retired	26.05	99.57	5.76	0.92	5.80	334
	Other	68.70	15.10	39.72	16.95	6.19	164
	<i>All</i>	75.22	33.93	19.03	7.09	7.30	1531
Italy	Working	92.17	13.17	4.99	3.97	8.40	703
	Education	82.29	15.74	5.19	3.17	15.37	130
	Unemployed	54.57	24.41	22.59	8.09	6.34	196
	Retired	23.30	91.28	3.33	1.06	12.47	261
	Other	62.00	32.28	5.70	4.50	11.39	227
	<i>All</i>	70.83	31.47	7.18	4.04	9.94	1517
Germany	Working	94.29	11.82	7.47	4.28	17.98	844
	Education	68.62	12.92	26.85	43.24	17.63	94
	Unemployed	36.50	6.83	70.01	8.76	9.16	55
	Retired	24.24	94.34	12.15	1.99	13.67	402
	Other	66.04	22.42	19.69	9.56	11.04	129
	<i>All</i>	71.19	34.92	13.49	6.83	16.11	1524
Sweden	Working	95.03	12.88	12.48	3.03	19.47	754
	Education	81.15	1.90	49.34	17.51	24.72	120
	Unemployed	48.17	21.21	55.66	15.47	10.45	113
	Retired	24.79	95.43	8.93	1.98	22.18	470
	Other	52.82	17.31	47.02	1.05	13.80	80
	<i>All</i>	66.72	37.94	19.33	4.67	19.70	1537

Notes: The table depicts the income types of the respondents' households by employment status of the respondent with survey weights applied. Rows do not sum up to 100%, since respondents could indicate several sources of income. "other" includes "unpaid family workers", respondents "doing housework, looking after children or other persons", or who answered "Other".

Table A2: Income and Income Positions - Missing Values and Means

Variables		Missing Values (in %)		Means		Difference	P-Value
		Without Follow-up	With Follow-up	Without Follow-up	Only Follow-up		
Poland	Actual Nat. Percentile	27.67	19.99	48.34	49.99	-1.64	0.56
	Perceived Nat. Percentile	34.85	23.25	40.20	36.85	3.35	0.01
	Perceived EU Percentile	28.76	24.98	24.21	21.98	2.23	0.41
Italy	Actual Nat. Percentile	32.77	22.26	45.20	45.17	0.03	0.55
	Perceived Nat. Percentile	39.88	28.92	45.13	39.84	5.29	0.01
	Perceived EU Percentile	36.10	31.59	34.57	32.08	2.49	0.85
Germany	Actual Nat. Percentile	21.95	17.46	48.25	49.89	-1.64	0.76
	Perceived Nat. Percentile	30.49	22.02	40.50	31.52	8.98	0.00
	Perceived EU Percentile	32.90	28.14	47.92	35.20	12.73	0.00
Sweden	Actual Nat. Percentile	25.05	17.77	49.33	43.50	5.83	0.03
	Perceived Nat. Percentile	25.31	18.16	39.49	32.96	6.53	0.00
	Perceived EU Percentile	27.04	21.64	48.85	38.11	10.74	0.00

Notes: The table depicts missing and mean values for the actual national position and the perceived national and EU income positions with survey weights applied. Columns 3 and 4 indicate the number of missing values (in %) in the respective variables without and with the answers of a follow-up question. Columns 5 and 6 show mean values of the actual national, the perceived national, and the perceived EU income position for respondents who gave a direct estimate and those who only gave an answer in the follow-up question. Column 7 and 8 show the difference in means between both groups and the p-values, resulting from T tests.

Table A3: Balance in Randomization for German Sample in the Pre-test

	EU First	National First	Difference	P-Value
Low Income (below 1500€)	0.23	0.22	0.02	0.46
Medium Income (1500€ - 3500€)	0.47	0.51	-0.05	0.13
High Income (above 3500€)	0.30	0.27	0.03	0.32
Low Education	0.21	0.20	0.01	0.82
Medium Education	0.34	0.33	0.01	0.70
High Education	0.45	0.47	-0.02	0.59
Female	1.44	1.46	-0.02	0.50
Age	50.45	49.57	0.88	0.39
Married	0.44	0.46	-0.02	0.55
Number Household Members	2.21	2.21	-0.00	1.00
Living in a City	0.41	0.40	0.01	0.70
Living in East Germany	1.22	1.23	-0.01	0.75

Notes: Columns 2 and 3 show the mean values for the EU First group (N=507) and the National First group (N=497). Column 4 and 5 show the difference in means between both groups and the p-values, resulting from T-tests.

Table A4: Balance in Randomization for German Sample in the Follow-up Survey

	Control	Single Treatment			Double Treatment		
	Mean	Mean	Diff.	P-Value	Mean	Diff.	P-Value
Actual Nat. Percentile	52.73	48.44	-4.29	0.11	47.70	-5.02	0.05
Actual EU Percentile	59.99	56.29	-3.70	0.13	55.54	-4.45	0.06
Perceived Nat. Percentile	38.47	38.75	0.29	0.79	38.65	0.18	0.83
Perceived EU Percentile	47.03	46.61	-0.42	0.83	46.29	-0.74	0.66
Rank: Country<EU	0.07	0.05	-0.02	0.31	0.07	-0.00	0.94
Rank: Country=EU	0.13	0.13	-0.01	0.90	0.11	-0.02	0.40
Rank: Country>EU	0.80	0.82	0.02	0.47	0.82	0.02	0.45
National Identity	0.31	0.27	-0.04	0.35	0.31	0.00	0.74
Female	0.48	0.47	-0.01	0.76	0.49	0.01	0.84
Low Education	0.20	0.20	0.00	0.82	0.18	-0.02	0.66
Medium Education	0.50	0.54	0.04	0.35	0.56	0.06	0.13
High Education	0.30	0.26	-0.04	0.22	0.26	-0.04	0.21
Age	50.30	51.89	1.59	0.20	52.07	1.77	0.15
Number of Children	1.15	1.23	0.08	0.55	1.05	-0.10	0.24
Working	0.55	0.51	-0.04	0.25	0.54	-0.02	0.70
In Education	0.04	0.04	0.00	0.92	0.04	0.00	0.96
Unemployed	0.05	0.04	-0.01	0.47	0.04	-0.01	0.52
Retired	0.29	0.35	0.06	0.09	0.33	0.05	0.23
Other	0.07	0.06	-0.01	0.74	0.05	-0.02	0.36
COVID-19 Affectedness	0.16	0.13	-0.03	0.47	0.09	-0.06	0.03

Notes: Columns 1,2 and 5 show the mean values for the control group (N=300), the Single treatment group (N=316) and the Double treatment group (N=307) in the follow-up survey in Germany with survey weights applied. Columns 3 and 4 show the difference in means between the control and Single treatment group and the p-values, resulting from T-tests. Columns 6 and 7 show the difference in means between the control and Double treatment group and the respective p-values.

Table A5: Question Order Treatment Effects for German Respondents in the Pre-test

	Dependent variable: Perceived EU=Nat. Percentile	
	(1)	(2)
Nat. Question First	-0.210*** (0.027)	-0.206*** (0.027)
Constant	0.363*** (0.021)	0.416*** (0.119)
Controls		Yes
Observations	1004	1004
R^2	0.057	0.075

Notes: Coefficients and robust standard errors (in parentheses) from OLS regressions. Dependent variable is the probability to estimate the same EU as national percentile (ref. not the same). Respondents in the *Nat. Question First* group were first asked about their national income position. Respondents in the reference group were first asked about their EU income position. Control variables are Household Income, Education, Gender, Age, Marital Status, Household Size, and indicators for living in the City and residing in East Germany. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: Perceived Difference - EU and National Position - with 20 Percentiles Tolerance

Country	Own Country perceived	Perceived Difference		
		EU<Nat	EU=Nat	EU>Nat
Poland	...close to EU average	0.67	0.24	0.09
Italy	...close to EU average	0.42	0.38	0.20
Germany	...close to EU average	0.23	0.34	0.43
Sweden	...close to EU average	0.14	0.38	0.48

Notes: The table displays the perceived difference between the EU and national income position of respondents who estimate a lower (EU<Nat), the same (EU=Nat) or a higher EU than national position (EU>Nat), restricted to respondents who rank their country close to EU average and allowing for a tolerance corridor of up to 20 percentiles. Survey weights are applied.

Table A7: Determinants of the Perceived Difference - EU and National Position

	Dependent variable: Perceived Difference			
	Poland		Italy	
	(1) EU<Nat.	(2) EU<Nat.	(1) EU<Nat.	(2) EU<Nat.
Country close to EU	-0.003 (0.042)	-0.016 (0.042)	-0.186*** (0.056)	-0.211*** (0.056)
Country higher than EU	-0.178*** (0.039)	-0.150*** (0.040)	-0.211*** (0.081)	-0.190** (0.084)
Constant	0.800*** (0.017)	0.512*** (0.162)	0.710*** (0.019)	0.670*** (0.205)
Controls		Yes		Yes
Observations	1008	1008	909	909
R^2	0.031	0.075	0.030	0.055
	Germany		Sweden	
	(1) EU>Nat.	(2) EU>Nat.	(1) EU>Nat.	(2) EU>Nat.
	(1) EU>Nat.	(2) EU>Nat.	(1) EU>Nat.	(2) EU>Nat.
Country close to EU	0.143** (0.067)	0.125* (0.068)	0.163*** (0.052)	0.161*** (0.053)
Country higher than EU	0.326*** (0.057)	0.285*** (0.059)	0.286*** (0.045)	0.272*** (0.045)
Constant	0.411*** (0.055)	0.409** (0.172)	0.493*** (0.041)	0.531*** (0.179)
Controls		Yes		Yes
Observations	1003	1003	1063	1063
R^2	0.050	0.074	0.056	0.078

Notes: Coefficients and robust standard errors (in parentheses) from OLS regressions with survey weights applied. Dependent variables are binaries: For Poland and Italy, $EU < Nat.$ indicates the likelihood to perceive the personal EU income position lower than the national income position (ref. equal/higher). For Germany and Sweden, $EU > Nat.$ indicates the likelihood to perceive the EU income position higher (ref. equal/lower). Main explanatory variable is the perceived rank against EU average (lower than EU, equal to EU, higher than EU). Control variables are National Identity, Gender, Education, Age, Age², Number of Children, Employment Status, Surroundings infected with COVID-19. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A8: Treatment Effects on National Misperceptions Three Months Later in Germany

	Size Misperception		Correct Position	
	(1)	(2)	(3)	(4)
Single Treatment	-3.553** (1.598)	-3.013** (1.478)	0.052 (0.038)	0.044 (0.036)
Double Treatment	-5.043*** (1.443)	-4.001*** (1.333)	0.044 (0.038)	0.029 (0.036)
Constant	24.593*** (1.121)	28.693*** (8.836)	0.265*** (0.026)	0.618*** (0.195)
Controls		Yes		Yes
Observations	847	847	847	847
R^2	0.014	0.177	0.002	0.138

Notes: Coefficients and robust standard errors (in parentheses) from OLS regressions with survey weights applied. Dependent variable in Model 1 and 2 is the size (absolute value) of the national income misperception and in Model 3 and 4 the probability to estimate a correct national income position. The *Single Treatment* informs about the EU income position; the *Combined Treatment* additionally informs about the national income position. Control variables are the Actual National Income Position, National Identity, Gender, Education, Age, Age², Number of Children, Employment Status, Surroundings infected with COVID-19. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Online Appendix B

Table B1: Determinants of the Perceived EU Income Position - Without Follow-up Questions

	Poland				Italy			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Perceived Nat. Percentile	0.419*** (0.032)	0.440*** (0.035)	0.452*** (0.032)	0.442*** (0.037)	0.558*** (0.044)	0.582*** (0.043)	0.554*** (0.042)	0.568*** (0.048)
Actual EU Percentile	-0.004 (0.034)	0.005 (0.038)	0.009 (0.035)	-0.015 (0.037)	0.063** (0.032)	0.038 (0.031)	0.058** (0.029)	0.062* (0.035)
Observations	897	868	966	756	768	779	863	636
R^2	0.245	0.242	0.261	0.252	0.366	0.369	0.349	0.400
No Follow-up for Income	Yes			Yes	Yes			Yes
No Follow-up for Nat. Pos.		Yes		Yes		Yes		Yes
No Follow-up for EU Pos.			Yes	Yes			Yes	Yes
	Germany				Sweden			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Perceived Nat. Percentile	0.739*** (0.029)	0.734*** (0.030)	0.741*** (0.028)	0.735*** (0.032)	0.737*** (0.032)	0.762*** (0.031)	0.749*** (0.031)	0.749*** (0.034)
Actual EU Percentile	0.135*** (0.025)	0.134*** (0.025)	0.131*** (0.025)	0.138*** (0.027)	0.083*** (0.023)	0.070*** (0.022)	0.079*** (0.023)	0.071*** (0.025)
Constant	27.720*** (6.004)	22.988*** (6.431)	23.237*** (6.041)	25.703*** (6.423)	19.248*** (7.412)	17.846** (7.331)	19.432*** (6.964)	22.163*** (7.741)
Observations	946	898	953	812	956	986	1001	850
R^2	0.634	0.630	0.631	0.636	0.626	0.644	0.634	0.637
No Follow-up for Income	Yes			Yes	Yes			Yes
No Follow-up for Nat. Pos.		Yes		Yes		Yes		Yes
No Follow-up for EU Pos.			Yes	Yes			Yes	Yes

Notes: Coefficients and robust standard errors (in parentheses) from OLS regressions with survey weights applied, excluding respondents who answered a follow-up question on their actual income (Model 1), their perceived national position (Model 2), their perceived EU position (Model 3) or who answered a follow-up question on either one of the three (Model 4). Dependent variable is the perceived EU income percentile. Independent variables are the perceived national income percentile and the actual EU income percentile. Control variables are National Identity, Gender, Education, Age, Age², Number of Children, Employment Status, Surroundings infected with COVID-19. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B2: Determinants of the Perceived Difference - EU and National Position - Without Follow-up Questions

	Dependent variable: Perceived Difference - EU and Nat. Position							
	Poland				Italy			
	(1) EU<Nat.	(2) EU<Nat.	(3) EU<Nat.	(4) EU<Nat.	(1) EU<Nat.	(2) EU<Nat.	(3) EU<Nat.	(4) EU<Nat.
Country close to EU	0.024 (0.042)	-0.032 (0.047)	0.003 (0.043)	0.024 (0.045)	-0.177*** (0.062)	-0.241*** (0.061)	-0.209*** (0.058)	-0.204*** (0.069)
Country higher than EU	-0.165*** (0.042)	-0.208*** (0.043)	-0.165*** (0.040)	-0.218*** (0.046)	-0.247*** (0.089)	-0.227** (0.089)	-0.199** (0.086)	-0.269*** (0.097)
Observations	897	868	966	756	768	779	863	636
R^2	0.077	0.097	0.065	0.120	0.055	0.063	0.059	0.063
No Follow-up for Income	Yes			Yes	Yes			Yes
No Follow-up for Nat. Pos.		Yes		Yes		Yes		Yes
No Follow-up for EU Pos.			Yes	Yes			Yes	Yes
	Germany				Sweden			
	(1) EU>Nat.	(2) EU>Nat.	(3) EU>Nat.	(4) EU>Nat.	(1) EU>Nat.	(2) EU>Nat.	(3) EU>Nat.	(4) EU>Nat.
	(1) EU>Nat.	(2) EU>Nat.	(3) EU>Nat.	(4) EU>Nat.	(1) EU>Nat.	(2) EU>Nat.	(3) EU>Nat.	(4) EU>Nat.
Country close to EU	0.131* (0.069)	0.090 (0.073)	0.131* (0.070)	0.094 (0.077)	0.194*** (0.056)	0.186*** (0.054)	0.164*** (0.054)	0.205*** (0.058)
Country higher than EU	0.297*** (0.060)	0.263*** (0.064)	0.295*** (0.061)	0.286*** (0.067)	0.308*** (0.048)	0.282*** (0.048)	0.285*** (0.047)	0.308*** (0.050)
Constant	14.672** (5.857)	16.566*** (5.944)	15.752*** (5.765)	13.070** (6.246)	21.929*** (6.857)	18.416*** (6.313)	19.769*** (6.455)	17.060** (7.240)
Observations	946	898	953	812	956	986	1001	850
R^2	0.076	0.076	0.078	0.084	0.089	0.080	0.082	0.100
No Follow-up for Income	Yes			Yes	Yes			Yes
No Follow-up for Nat. Pos.		Yes		Yes		Yes		Yes
No Follow-up for EU Pos.			Yes	Yes			Yes	Yes

Notes: Coefficients and robust standard errors (in parentheses) from OLS regressions with survey weights applied, excluding respondents who answered a follow-up question on their actual income (Model 1), their perceived national position (Model 2), their perceived EU position (Model 3) or who answered a follow-up question on either one of the three (Model 4). Dependent variables are binaries: For Poland and Italy, $EU < Nat.$ indicates the likelihood to perceive the personal EU income position lower than the national income position (ref. equal/higher). For Germany and Sweden, $EU > Nat.$ indicates the likelihood to perceive the EU income position higher (ref. equal/lower). Main explanatory variable is the perceived rank against EU average (lower than EU, equal to EU, higher than EU). Control variables are National Identity, Gender, Education, Age, Age², Number of Children, Employment Status, Surroundings infected with COVID-19. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B3: Effects of the Treatments on Misperceptions Three Months Later - Without Follow-up Questions

	Size Misperception				Correct Position			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Single Treatment	-4.153*** (1.456)	-4.662*** (1.523)	-4.357*** (1.449)	-3.438** (1.566)	0.100** (0.039)	0.130*** (0.040)	0.117*** (0.040)	0.100** (0.042)
Double Treatment	-3.351** (1.485)	-4.012*** (1.519)	-3.157** (1.498)	-3.262** (1.587)	0.107*** (0.041)	0.125*** (0.042)	0.108*** (0.040)	0.109** (0.044)
Constant	25.298*** (8.288)	20.580** (8.206)	22.938*** (8.004)	24.514*** (8.604)	0.367 (0.227)	0.481** (0.225)	0.509** (0.221)	0.401* (0.237)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	769	748	774	676	769	748	774	676
R^2	0.122	0.114	0.115	0.116	0.083	0.077	0.084	0.082
No Follow-up for Income	Yes			Yes	Yes			Yes
No Follow-up for Nat. Pos.		Yes		Yes		Yes		Yes
No Follow-up for EU Pos.			Yes	Yes			Yes	Yes
	Correct Difference				Correct Rank			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Single Treatment	-0.042 (0.040)	-0.052 (0.042)	-0.046 (0.041)	-0.077* (0.044)	0.016 (0.032)	0.016 (0.032)	0.016 (0.032)	0.026 (0.036)
Double Treatment	-0.012 (0.040)	-0.010 (0.042)	-0.015 (0.041)	-0.027 (0.044)	0.016 (0.031)	0.016 (0.031)	0.016 (0.031)	0.017 (0.035)
Constant	0.582*** (0.210)	0.612*** (0.219)	0.523** (0.215)	0.528** (0.228)	0.770*** (0.162)	0.770*** (0.162)	0.770*** (0.162)	0.783*** (0.174)
Observations	802	737	762	665	923	923	923	760
R^2	0.030	0.028	0.028	0.036	0.103	0.103	0.103	0.107
No Follow-up for Income	Yes			Yes	Yes			Yes
No Follow-up for Nat. Pos.		Yes		Yes		Yes		Yes
No Follow-up for EU Pos.			Yes	Yes			Yes	Yes

Notes: Coefficients and robust standard errors (in parentheses) from OLS regressions with survey weights applied, excluding respondents who answered a follow-up question on their actual income (Model 1 and 5), their perceived national position (Model 2 and 6), their perceived EU position (Model 3 and 7) or who answered a follow-up question on either one of the three (Model 4 and 8). In Panel a), dependent variable in Model 1-4 is the size (absolute value) of the EU income misperception and in Model 5-8 the probability to estimate a correct EU position. In Panel b), dependent variable in Model 9-12 is the probability to perceive a higher EU than national income position and in Model 13-16 the probability to rank the country higher than EU average. The *Single Treatment* informs about the EU Income Position; the *Single Treatment* additionally informs about the national income position. Control variables are the Actual National Income Position, National Identity, Gender, Education, Age, Age², Number of Children, Employment Status, Surroundings infected with COVID-19. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B4: Effects of the Treatments on National Misperceptions Three Months Later - Without Follow-up Questions

	Size Misperception				Correct Position			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Single Treatment	-2.214 (1.495)	-3.053* (1.573)	-2.626* (1.518)	-2.213 (1.643)	0.028 (0.037)	0.056 (0.038)	0.043 (0.037)	0.040 (0.039)
Double Treatment	-3.810***	-4.914***	-3.772***	-4.869***	0.025	0.054	0.030	0.049
Constant	34.379*** (9.170)	29.967*** (9.138)	30.654*** (8.969)	33.888*** (9.530)	0.472** (0.201)	0.634*** (0.201)	0.619*** (0.198)	0.561*** (0.208)
Observations	800	776	806	701	800	776	806	701
R^2	0.170	0.163	0.169	0.155	0.125	0.130	0.134	0.117
No Follow-up for Income	Yes			Yes	Yes			Yes
No Follow-up for Nat. Pos.		Yes		Yes		Yes		Yes
No Follow-up for EU Pos.			Yes	Yes			Yes	Yes

Notes: Coefficients and robust standard errors (in parentheses) from OLS regressions with survey weights applied, excluding respondents who answered a follow-up question on their actual income (Model 1 and 5), their perceived national position (Model 2 and 6), their perceived EU position (Model 3 and 7) or who answered a follow-up question on either one of the three (Model 4 and 8). Dependent variable in Model 1-4 is the size (absolute value) of the national income misperception and in Model 5-8 the probability to estimate a correct national position. The *Single TRT* informs about the EU Income Position; the *Double TRT* additionally informs about the national income position. Control variables are the Actual National Income Position, National Identity, Gender, Education, Age, Age², Number of Children, Employment Status, Surroundings infected with COVID-19. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.