Social Positions and Fairness Views on Inequality*

Kristoffer B. Hvidberg, Claus T. Kreiner, and Stefanie Stantcheva

October 2021

Abstract

We link survey data on Danish people's perceived income position and views of inequality within various reference groups to administrative records on their reference groups, income histories, and life events. For all reference groups, people exhibit center bias, whereby lower-ranked respondents in a group tend to place themselves higher because they think others' incomes are lower, while higher-ranked respondents place themselves lower. People view inequalities within co-workers and education group as most unfair, but underestimate inequality most exactly within these groups. Perceived fairness of inequalities is strongly related to current position, moves with shocks like unemployment or promotions, and changes when experimentally showing people their actual positions.

*Hvidberg: University of Copenhagen and CEBI (email: kristoffer.balle.hvidberg@econ.ku.dk). Kreiner: University of Copenhagen, CEBI, CESifo, and CEPR (email: ctk@econ.ku.dk). Stantcheva: Harvard University, CEPR, and NBER (e-mail: sstantcheva@fas.harvard.edu). We thank Beatrice Ferrario, Leonardo D'Amico, Ida Maria Hartmann and Isabel Skak Olufsen for excellent research assistance. We are also grateful for comments by seminars participants in the Deaton workshop on Attitudes Towards Inequality, the Selten Lecture in Bonn, IFN in Stockholm, NHH in Bergen, LSE, UCSD, UC Berkeley, the NBER Public Economics Meetings, and Zurich. We thank Ingvild Almås, Asger Andersen, Richard Blundell, Dietmar Fehr, Ernst Fehr, Søren Leth-Petersen, Andreas Peichl, Ricardo Perez-Truglia, Emmanuel Saez, Julien Senn, David Seim, Krishna Srinivasan, Bertil Tunggoden, Andrea Weber, Roberto Weber, and Matthew Weinzierl for feedback and suggestions. The activities of CEBI are financed by the Danish National Research Foundation grant DNRF134. We are also grateful for financial support from the Candys Foundation. The use of the data for this project complies with Danish legislation (persondataforordningen, forordning 2016/679 om persondatabeskyttelse) and has been approved by the The Danish Data Protection Agency (file number 514-0018/2018-2000 at University of Copenhagen). The project includes a randomized information treatment and was preregistered in the AER RCT Registry (AEARCTR-0003923). The paper circulated for some time under the title "Social Position and Fairness Views."

People's social positions can affect their views on a range of issues. A long-standing literature on social status, economic decision-making, and subjective well-being shows that people care about their positions relative to others (Duesenberry, 1949; Easterlin, 1974, 1995; Blanchflower and Oswald, 2004) and theoretical work in Political Economy and Public Economics highlights that social positions are important for fairness considerations and redistribution policy (Boskin and Sheshinski, 1978; Meltzer and Richard, 1981; Bénabou and Ok, 2001; Alesina and Angeletos, 2005). But how well do people actually know their own position relative to others within different reference groups, such as their neighbors, their co-workers, their cohort, or people with the same level of education? How does their social position in these groups affect their views on the fairness of inequality? Are they better or less well-informed about inequality and social position where it matters the most to them?

Studying these questions is challenging because of the data requirements. To understand how accurately people rank themselves among others in a given reference group – say, their neighbors – we need to know the incomes of all people in that group. Furthermore, if we find that people misperceive their position, we would need to know whether it is due to erroneous assessments of their own income or the income distribution among their neighbors. Doing this for several reference groups is even harder, especially as we move from larger to smaller and more specific (but potentially highly relevant) reference groups such as co-workers in one's firm, people of the same age in one's city, or former schoolmates. In addition, studying how changes in social position affect people's views requires having information on people's income histories, as well as the income histories of their reference groups.

To overcome these challenges, we leverage a unique dataset constructed by linking responses from a custom survey of a large sample of people in Denmark born between 1969 and 1973 to detailed administrative data on their full income histories, life events, and true positions in the income distributions of different "reference groups." The reference groups include large groups such as people from the same cohort and of the same gender, living in the same municipality, having the same education level, or working in the same sector, as well as smaller groups such as neighbors, co-workers in the same firm, family members, and former schoolmates. In the survey, we ask people about their knowledge of the income distributions in these reference groups, how fair they think income inequalities within these groups are, and where they rank themselves within the various groups (i.e., their income or "social" position within each group).

The link between survey and administrative data enables us to explore in a new way how well people know their positions in various reference groups and the relationship between social positions and fairness views. It also allows us to pinpoint where misperceptions come from, because we can verify the accuracy of perceptions of own income by using the respondent's own tax return, as well as of the income distributions and positions in each group, which we can compute from the tax returns of all people in the reference groups. The link also enables us to study how changes in social positions over the course of life, including changes due to unemployment, health shocks, and promotions, affect fairness views. Finally, we can also inform individuals of their true social

positions and experimentally study how this information shapes these views.

Our results can be grouped into four main sets of findings. First, in all reference groups, respondents systematically misperceive their position. Lower-income respondents believe they are ranked higher in the distribution than they really are, while higher-income respondents, except at the very top, believe they are ranked lower. We call this pattern "center bias."[1] This is due to lower-income respondents underestimating everyone else's incomes and higher-ranked respondents overestimating others' incomes. Thus, in general, people tend to think others are closer to themselves than they are and underestimate the extent of inequality.

Second, the magnitude of these misperceptions differs by reference groups. An important reference group is one's cohort, as it captures the overall income distribution in the country, while controlling for lifecycle effects. Respondents are relatively accurate about their position in their cohort and their cohort's income distribution. For instance, 45% of the respondents perceive the median income level of their cohort correctly with at most 10% error. For comparison, 70% recall their own income correctly within the same error band. At most positions in the income distribution, the average perception is within 5% of the actual median and within 10% of the actual 95th percentile. The most striking misperception is that people at the very top of the distribution (above the 95th percentile) overestimate the 95th percentile level by 50%. Hence, top earners tend to think that other top earners are on average much richer than in reality.

The relatively small misperceptions of position within the cohort do not apply to all other reference groups. In particular, respondents perceive quite accurately the median income level for all reference groups, but systematically underestimate the 95th percentile income level among their co-workers in their sector and among people with same education. Lower-ranked individuals overestimate their social position most within their education group or work sector. For example, people at the 20th percentile among their co-workers on average think they are well above the 40th percentile, while people at the 20th percentile in their municipality believe they are around the 30th percentile. This pattern also holds if we zoom in on smaller reference groups, namely co-workers within a firm instead of within sector, and if we look at neighbors in their immediate vicinity instead of people living in the same municipality. Respondents are better at predicting where they rank relative to former schoolmates than relative to current co-workers. Furthermore, they have very little idea about the social positions of their parents when they were around the same age.

The third set of findings shows that fairness views on inequality across all the reference groups strongly depend on the current social positions of individuals. We show this link in three ways: First, we highlight that views on the fairness of inequalities are more strongly correlated with current social position than with historical (past) social positions. On the contrary, political views are more

[1] We use the term "center bias" as opposed to "middle class bias" in Fehr et al. (2019). In our case, the patterns observed are not driven by people thinking they are all middle-class. Instead, the center bias appears in all reference groups, some of which have low average incomes and others which have high average incomes. The "center" position in these groups are different and cannot all be considered middle-class.

weakly correlated with current social position and more strongly correlated with respondents' past social positions and even significantly correlated with the social position of their father when they were growing up. Second, we show that changes in social positions following life events affect fairness views. Conditional on a detailed array of individual-level controls and starting social position, we find that the perceived fairness of inequality significantly declines with negative shocks (unemployment spells, hospitalization episodes, or disability) and increases with positive income shocks (promotions at work). Third, we exploit our randomized information treatment that informs individuals of their true positions in their reference groups. This information affects views on the fairness of inequality within all reference groups, but in an asymmetric manner. Those who overestimated their social position in any of the reference groups to start with believe inequality is more unfair when they are informed of their actual (lower) social position. In contrast, those who are told that they are ranked higher than they thought do not adjust their fairness views. In line with the overall correlation patterns, people's political views respond much less than fairness views to the information treatment and the real-life shocks.

Fourth, people view inequality within peers working in the same sector or with same education level as more unfair than inequality among peers of the same age, same gender, or living in the same municipality. This suggests that inequality that remains conditional on core economic characteristics that people think do shape earnings, like education and sector, are perceived as more unfair that inequalities on characteristics that are not perceived as relevant for income (like municipality, age, or gender). Yet, education and sector groups are exactly the reference groups within which respondents tend to underestimate the degree of inequality the most and within which lower-income people strongly overestimate their own positions.

Related Literature. Crucial for our results is the link between survey data on people's perceptions and attitudes and information from administrative records on their real-life outcomes. Recent research has started to combine subjective information from surveys with objective information from administrative records to answer different questions (Almås et al., 2017; Kreiner et al., 2019; Andersen and Leth-Petersen, 2020; Epper et al., 2020; Londoño-Vélez, 2021). Related to our question of the role of social positions, one previous study (Karadja et al., 2017) has merged survey data and administrative data in Sweden to check the reported income of respondents against actual income. One of our key contributions is to go much further by, first, using the administrative records to obtain information on many of the reference groups of the respondents that vary by domain, size, and proximity to the respondent and to show their relationship to views on the fairness of inequality within these groups. Second, we can match survey data to respondents' income histories over the life cycle, and their experience of major life events.

Connected to our result on the perceived position within co-workers in the same firm, recent papers have analyzed the impacts on satisfaction and effort of within-firm or within-employer wage differences, focusing on one or several specific employers (Card et al., 2012; Cullen and Perez-Truglia, 2018a,b; Baker et al., 2019). Complementary to these studies, our new findings across

many employers, firms, and sectors show that people care more about income differences within co-workers, as compared to other reference groups, and that they particularly strongly misperceive inequality and their own income position within this reference group.

A second contribution is our analysis of the link between changes in social position and fairness views using the unique combination of information on individual income histories back in time, income shocks that shift social positions, and randomized information treatments. Previous literature has looked at the relationship between tastes for redistribution and living or growing up in different environments (Roth and Wohlfart, 2018; Giuliano and Spilimbergo, 2014; Malmendier and Nagel, 2011). Andersen et al. (2020) show that winning a housing lottery in Ethiopia does not change respondents's views on redistribution and inequality acceptance, but reduces their willingness to tax homeowners and increases their likelihood to attribute poverty to character traits. We can zoom in on experiences at the individual respondent's level and consider changes in social positions of the respondents and specific shocks, such as unemployment, promotions at work, hospitalizations, and disability.

Related to our information experiment, Kuziemko et al. (2015) show respondents information on the actual distribution of income in the U.S. and where they rank based on self-reported income in the survey, but are unable to study how it relates to misperceptions or to different reference groups. In a survey of around 1,000 households in Buenos Aires, Cruces et al. (2013) find that those who overestimate their position in the overall national distribution tend to demand higher levels of redistribution when informed about their true position. On the contrary, Hoy and Mager (ming) provide a randomized survey experiment across 10 countries where they inform respondents of their position in the national income distribution and show that telling people they are poorer than they thought does not make them more supportive of redistribution. Finally, Karadja et al. (2017) show that almost 86% of the Swedish respondents in their 1,242 sample underestimate their position in the national income distribution and those who are informed of their higher actual position demand less redistribution. Fehr et al. (2019) provide information about position in both the national and international distribution and find that only demand for national redistribution decreases with national relative income. Our match to the administrative data allows us to verify the accuracy of a respondent's own income (which only Karadja et al. (2017) among these papers can do) and to consider many other relevant reference groups (other than the national income distribution), as well as respondents' income histories and economic experiences over time.

Our third contribution is to show that people systematically underestimate inequality by believing others are closer to themselves than they really are, across many groups. We use the term "center bias" as opposed to "middle class bias" in Fehr et al. (2019) because this pattern is observed across all reference groups and the center of these groups is not necessarily "middle-class." We can also pinpoint where these misperceptions come from, namely from misperceptions of others' incomes. For some reference groups, such as the cohort, these systematic misperceptions are relatively small. This stands in contrast to the existing studies on people's perceived ranking in the *national income distribution* (Cruces et al., 2013; Karadja et al., 2017) and *global* income distribu-

tion (Fehr et al., 2019). For other groups, such as those defined by sector of work or education level, misperceptions are much larger. In general, eliciting misperceptions is a challenging task because poorly worded or calibrated survey questions could themselves cause confusion and errors among respondents. Our study contributes a number of methodological advances to the elicitation of such perceptions, which gives us confidence in the accuracy of the responses. First, eliciting people's perceptions of the income distribution allows us to disentangle possible misperceptions along those dimensions from misperceptions of own position. We focus on people's position relative to peers of their cohort, which neutralizes large differences due to life cycle effects. Indeed, as we show, small changes in the definition of the relevant age group (e.g., cohort, vs. all adults, or the full working population, or the total population including those below 18 and retirees) have large effects on the percentiles of the distributions, which makes it important to ask people about their position in very clear and well-defined groups. Furthermore, position within one's cohort is arguably a more relevant measure of social position for fairness concerns than thinking about position relative to people of all ages. We also use a well-defined concept of income, by asking respondents in the survey about income as it appears on their last tax return and their corresponding perceptions about income positions. This allows us to distinguish misperceptions of social position from misreporting or misperception of own income. To make the elicitation procedure as precise as possible, we use video instructions with illustrations on income ladders to explain the concept of income positions and what respondents are asked to do, and a corresponding graphical interface where respondents report percentile levels (median, "P50", and 95th percentile, "P95"), and their own positions in the distribution. Finally, our sample is an order of magnitude larger than existing studies, which implies that we can provide more precise evidence.

Our paper is also broadly related to empirical work documenting that people care about relative income and that their social positions shape their well-being (Easterlin, 2001; Easterlin et al., 2010; Clark and Oswald, 1996). Luttmer (2005) shows that holding own income constant, self-reported happiness declines as neighbors' incomes increase. Using German panel data, Ferrer-i-Carbonell (2005) finds that people's income rank in their reference group is a determinant of happiness and well-being whose importance is comparable to that of their own income. Kuziemko et al. (2014) highlight the role of "last-place aversion," a particular form of relative position concerns whereby individuals particularly fear being ranked last. Charité et al. (2015) point out the importance of reference points, while we highlight the need to consider specific reference groups. Fisman et al. (2020) show that people care about inequality in a non-linear way relative to their own position, putting weight both on their nearest neighbors and on the top of the distribution. Using online surveys, Weinzierl (2014) demonstrates that people do not hold utilitarian preferences, but rather have other, mixed fairness views.

Organization. Section 1 describes our survey, the administrative data, and our sample. Section 2 analyzes respondents' perceptions and misperceptions about the distributions of income and their own position in various reference groups. Section 3 studies the relationship between perceived social

position and fairness views. Section 4 offers some concluding remarks.

1 Data Collection, Survey, and Administrative Data Linkage

1.1 Survey Sample and Link to Administrative Data

Target Sample. Assisted by Statistics Denmark, we conducted a large-scale survey in February and March 2019. We sent out survey invitations to a representative sample of 50,100 respondents, born in Denmark in the years from 1969 to 1973, randomly selected by Statistics Denmark. The respondents were 45 to 49 at the time of the survey and, hence, no longer enrolled in formal education, well into their careers with a large share of their lifetime income realized, but still quite far from retirement. We excluded immigrants because we ask people about histories, schoolmates, and parental positions, which are only available for Danish-born respondents.

Survey Method. Our survey method is original and leverages an official channel of communication of the Danish public authorities with citizens. The invitations were sent out through the secure website "Digital Post," used to receive and read mail from public authorities. By law, all citizens older than 15 have to have an electronic mailbox where they receive information from public institutions, for example tax and health authorities. Communications may also come from private companies, for instance salary statements from employers or account statements from banks. The use of this official channel of communication, together with the University of Copenhagen's stamp, likely increased the credibility of our survey and experiment, and of the information provided to respondents, which sets the setting apart from lower-stakes survey environments. To incentivize respondents further, they were told that those who completed the full survey would be enrolled in a lottery for 100 gift cards with a value of 1,000 DKK ($150) each to be used in more than 150 chains of stores in Denmark.

The average time for completion of the survey was 33 minutes with a median time of 25 minutes (the full distribution of time spent on the survey can be seen in Appendix Figure A-5). Responses were linked by Statistics Denmark to the register data using the social security number (assigned to all Danes at birth), which ensures a precise and unique match.

Testing for Selection into the Survey and Attrition. Thanks to the register data, we can analyse selection into the survey. Indeed, we know the characteristics of the respondents who entered the survey, of those who completed it, of those who were sent an invitation but chose not to participate, and of those who were not sent an invitation at all. Table 1 shows summary statistics for our sample of people who received an invitation and completed the survey (column 1), and compares it to the characteristics of those who received an invitation to participate and started the survey, regardless of whether they completed it or not (column 2), the characteristics of the full Danish-born population in these cohorts, excluding non-Danish born people (column 3) and the full population in these cohorts, including immigrants (column 4). The invitee group of people

Table 1: Summary statistics: Sample compared to population

	Analysis sample (1)	**Started survey** (2)	**Full population (excl. immigrants)** (3)	**Full population** (4)
Demographics				
Male	0.51	0.47	0.51	0.50
Age	47.0	47.0	47.0	47.0
Married	0.63	0.61	0.57	0.58
Immigrant	0.00	0.00	0.00	0.13
Descendant	0.00	0.00	0.01	0.00
Income Position				
Income position	64.2	59.6	53.3	50.5
Bottom 50%	0.29	0.36	0.46	0.50
Middle 40%	0.54	0.50	0.43	0.40
Top 10%	0.17	0.14	0.11	0.10
Education				
Primary education	0.08	0.10	0.16	0.17
Upper secondary edu.	0.06	0.06	0.05	0.06
Vocational education	0.31	0.34	0.39	0.38
Short cycle higher edu.	0.09	0.08	0.07	0.07
Bachelor programs	0.27	0.26	0.20	0.20
Masters programs	0.19	0.17	0.13	0.13
Socio Economic Status				
Self-employed	0.04	0.04	0.06	0.06
Employee	0.90	0.87	0.80	0.77
Unemployed	0.01	0.02	0.02	0.02
Not in work force	0.05	0.07	0.12	0.14
Private Sector	0.66	0.65	0.69	0.70
Regions				
Copenhagen	0.31	0.30	0.30	0.32
Sealand	0.16	0.16	0.16	0.15
Southern Denmark	0.21	0.21	0.21	0.21
Middle Jutland	0.23	0.23	0.23	0.22
North Jutland	0.09	0.09	0.10	0.10
Parents' Income				
Mother's income position	53.1	52.1	50.5	50.2
Father's income position	53.3	52.4	50.8	50.5
Observations	9415	13686	339231	389863

Notes: Full Population is the full Danish population born between 1969 and 1973. *Full population* (*excl. immigrants*) is the population our contact sample was drawn from. This sample was provided by Statistics Denmark and is the full population excluding immigrants. *Started survey* are the respondents who started the survey. *Analysis sample* are respondents who completed the survey and are used in the analysis. All variables are indicators, except for the income positions, which are based on the percentile rank position within the cohort of the respondent.

who received an invitation to participate, regardless of whether they did start the survey or not, is not shown here as it is almost perfectly identical to the full Danish-born population excluding immigrants (column 3) in these cohorts, as should be the case given that they were randomly drawn from this group by Statistics Denmark. The final analysis sample of respondents who completed the survey has on average somewhat higher income and education levels than the full target population in column 3, but is representative in terms of region of residence, age, and gender. Compared to other surveys, the top of the income distribution is very well-represented. People from the top five percent of the income distribution make up almost 8% of our analysis sample.

The use of the official Digital Post channel are perhaps the reason we are able to sample extensively from the top of the income distribution, a group that is typically very hard to reach with standard survey methods.

Out of the 50,100 people invited from the population 13,686 clicked on the personal link in the invitation (column 2) and 10,089 completed the survey. After dropping respondents for whom the reported birth year or gender do not match the register data (19 respondents), who spent less than ten minutes answering the survey (50), who did not report their income as instructed in the survey for example by reporting monthly instead of annual income (343), had zero or negative income according to the register data or missing background register data (61) or who skipped one of our key questions (201), we have 9,415 respondents in total (column 1).[2] The response rate of 20% (=10,089/50,100) is reasonably high when contacting a representative sample of new potential respondents that have never expressed a particular interest in taking surveys.[3]

Appendix Table A-1 highlights which characteristics predict the drop out rate and at which point respondents drop out. Out of those who start the survey, 6% dropped out at the consent page or are screened out for the reasons listed above; 10% drop out when having to report their income. Only 1% drop out after the treatment. This means that attrition is not selectively driven by the treatment, as confirmed by the insignificant coefficient on treatment status. Men, non-married, higher-income and more educated respondents are less likely to drop out.

1.2 Survey Outline

The survey consists of five blocks of questions and is available in full in Appendix A.1. In addition, a consent page informs respondents about the use of their responses in accordance with the General Data Protection Regulation of the European Union and a conclusion section asks respondents

[2]The completion rate of 74% (=10,089/13,686) may seem low, but our invitees are not people who have signed up in advance to participate in survey panels as is the case in other settings. Instead, our potential respondents receive an invitation through the official Digital Post, which probably leads many to click on the survey link in order to learn more about this somewhat unusual for them invitation. Once people realize it is a research survey they are not obliged to answer and they have to report personal information some of them drop out. In regular survey settings where respondents have signed up to receive survey links, those not interested do not even click on the link to start with as there is no element of surprise for them. In our case this will appear as attrition, while in other settings, we will never get to see who did not click on the survey link to start with.

[3]For comparison, a recent study in Denmark invited similar cohorts by ordinary mail and reports a response rate of 13% (Epper et al., 2020).

whether they thought that the survey was left- or right-wing biased. 81% think the survey is neutral, 14% that it is left-wing biased and 5% that it is right-wing biased.

Background and Political Views block. This block contains questions on birth year, gender, educational attainment, and sector of employment. These answers are later used to inform respondents about their positions relative to other people in the same large reference groups (see Table 2 for a definition of each reference group). We also ask about voting behavior and attitudes towards economic policy:

"Which party did you vote for in the last general election (in 2015)? [10 parties; Other; Did not vote; Do not wish to answer]"

"How would you describe your attitude on economic policy? [Very left-wing; Left-wing; Moderate; Right-wing; Very right-wing]"

Income block. This block asks about the income of the respondent one year ago (earned in 2017) and includes wage income, self-employment income, and taxable income benefits and transfers (composed mainly of unemployment insurance benefits, disability benefits and social assistance). We ask separately about these three income components and with the sum of the components appearing on the screen (see an image of the exact formulation in Appendix Figure A-1). The breakdown of total income into smaller parts is done to help people report the correct income and to highlight that self-employment income and taxable benefits are included in total income. We include taxable benefits and transfers to reflect the fact that they contribute to income and leaving them out may lead us to wrongly rank individuals, e.g., individuals receiving UI benefits are in general better off economically both in the short run and in the long run than individuals receiving social assistance. Respondents are informed that it is important to report the income correctly and that they can see the amounts on their annual tax statement (available online). Our rationale for asking about income as it appears on the tax statement is to be able to base the analysis on a well-defined income concept that is both clear to the respondent and for which the true value can be verified in the register data. With the exception of self-employment income, the income components are third-party reported to the tax agency and pre-populated on the tax return. Tax evasion is in general low in Denmark and close to nil on third-party reported income components (Kleven et al., 2011).

To avoid making the survey too complicated and time consuming, we exclude capital income, deductions and tax payments. This is not an important issue for our analysis for two reasons. First, our narrower income definition makes up almost all of total income as calculated by Statistics Denmark for most respondents, which includes capital income. Thus, the average across individuals of our narrower income concept relative to average total income according Statistics Denmark is 96.0%; the median income according to our definition represents 98.5% of the median total income according to Statistics Denmark.

Second, and crucially, Appendix Figure A-6 shows that the income rank positions based on total income line up almost perfectly with the the positions based on our income definition. In fact, this remains the case if we instead used a third definition of income, namely Statistics Denmark's measure of "disposable income" that includes the imputed value of housing, interest deductions, and tax payments.

Table 2: Definition of reference groups

Reference group	**Definition**
Large reference groups	
Cohort	People born the same year.
Gender	People born the same year with the same gender.
Municipality	People born the same year currently living in the same municipality.
Educational level	People born the same year with the same level of education: basic school, upper secondary education, vocational education and training, short cycle higher education, bachelor degree and master or PhD degree. Uses the Danish DISCED education classification, which follows the international education classification ISCED.
Sector of work	People born the same year and working in the same sector: Construction, real estate, business services, finance and insurance, trade and transport, manufacturing, information and communication, culture, agriculture, public work. Uses the Danish Sector Codes DB07, which is a sub-classification of the NACE classifications of the EU.
Small reference groups	
Schoolmates	People born the same year who went to the same school the year they turned 15.
Co-workers	People working in the same workplace. Workplace is defined as a single address entity, e.g., for a firm with multiple locations, each location is a separate workplace.
Neighbors	For people living in an apartment, the neighbors are people from age 25 to 65 who live in the same stairwell. For people living in a house, the neighbors are people from age 25 to 65 who live on the same road.

Perceptions block. This block elicits people's perceptions about the median (hereafter, P50), the 95th percentile (hereafter, P95) and their own position in the distribution of each of the five large reference groups. The block starts with a video that uses a ladder and 100 stick people to explain the different positions in the income distribution. It states and illustrates, for instance, that the P50 is the income level for which 50% have a lower income and 50% have a higher income. The

full script for and link to the video are in Appendix A.2. After this video, we elicit respondents' perception of the P50 and P95 incomes for their cohort (see Appendix Figure A-2). We then ask the respondents to use a horizontal slider to indicate their perceived P50 and P95 income levels for their municipality, education group, gender group, and sector (see Appendix Figure A-3). Respondents are subsequently prompted to place themselves within each of the five large reference groups using a vertical slider next to the illustrative ladder that was also used in the explanatory video (see Panel A of Figure 1). We also ask respondents about their parents' positions in the income distribution of all the parents of the other people in their cohort and to compare their own income to that of their sibling(s). For neighbors, co-workers, and former schoolmates, we first asked the respondent about the perceived number of individuals in these reference group (denoted by N) and then asked them to report their perceived income position on a horizontal slider going from 1 to N (see e.g., Figure A-4 for the co-worker question). For these small reference groups, it does not make sense to ask about moments of the distribution such as P50 and P95 as we do for the large reference groups.

Treatment block. This part is presented for the treatment group at this point in the survey and for the control group at the very end of the survey (so that it does not affect any of their answers). The treatment informs respondents about their true social positions. Based on the respondents' earlier answers to the questions in the background and income blocks, we interactively calculate their true positions in each of the five large reference groups. *For each of these five reference groups,* the treatment reminds people which position they had earlier responded to be in, shows them their actual position, and highlights how much higher or lower they are in the distribution compared to where they thought they were. Panel B of Figure 1 shows a screenshot from one of the treatment screens (in English, and only for the cohort reference group) for a fictitious respondent with a positive misperception of their own position within her cohort. In this example, the respondent indicated that they thought they were ranked at position 70; the treatment informs them that they are, in fact, ranked at position 57 and points out the misperception gap in red on the ladder and numerically in the text above. The misperceptions of the positions within the other four reference groups are shown in the same way.

An alternative treatment could construct many sub-samples and inform respondents about their true position in only a single group. However, informing respondents of their position in one reference group only may still make them update their beliefs about their position in the other groups, but in a way we do not control. By telling them their actual positions in each group, we are certain about the information provided. Due to Danish rules of conduct, we cannot show respondents their true position in the small reference groups (co-workers, neighbors, former schoolmates).

Appendix Table A-2 shows that the treatment and control groups are balanced in terms of observable respondent characteristics.

Outcomes block. This sequence asks about views on fairness of inequality within the respondent's cohort and (large) reference groups, and also about the role of effort versus luck, and political view.

For each reference group, we asked a standard question about fairness of inequality and a standard question about the role of effort versus luck. We only asked two questions to avoid increasing the length of the survey too much and selected questions that could be applied with the same formulation across all reference groups. However, we also asked a few questions related to general well-being and views on inequality and show results for these outcomes in Appendix D.

The main questions are as follows:

"On a scale from 1 to 7 where 1 is "Completely fair", 4 is "Neither fair nor unfair" and 7 is "Completely unfair", indicate to what extent you think that it is fair or unfair that there are differences in income among people born the same year as you WITHIN the following groups that you are yourself a part of?"

[The screen then lists five reference groups, filling out their labels directly with the respondent's information from the earlier block, as can be seen in Panel C of Figure 1.]

"Now, think about people born the same year as you WITHIN these groups (indicated below). On a scale from 1 to 7 where 1 is "Only luck", 4 is "Equally important", and 7 is "Only effort", indicate to what extent you think that differences in income are caused by differences in people's efforts over their lifetime or rather by luck? By luck, we mean conditions, which you have no control over. By effort, we mean conditions, which you can control."

"Which party would you vote for if there was a general election today? [11 parties; Other; Do not wish to answer]"

1.3 Response Quality

Reported incomes in the survey match the actual incomes on tax returns well. The average percentage difference between reported and actual income is less than 0.5%. More than 25% of the respondents report an income that is within 1% of their actual income and more than 70% of the respondents report an income that differs by at most 10%. Appendix Figure A-7 shows the full distribution of differences between reported and actual income.

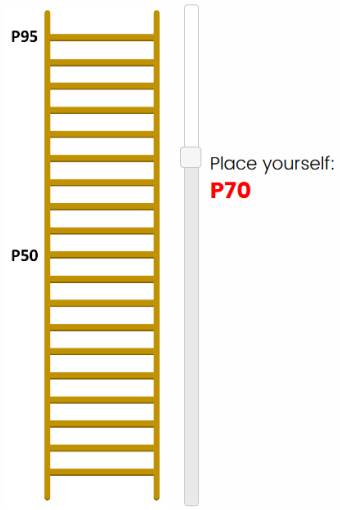
Next, we describe how the reference groups reported by the respondents align with the the official classifications in the administrative data and how we can account for possible discrepancies in the analysis. Appendix Table A-3 shows that information on gender and cohort are aligned and that 98% of the respondents report living in the correct municipality. Respondents are also relatively precise when they report educational level and sector of work, and the mismatches can be explained and dealt with in a consistent manner. Overall, for 74% of respondents, education levels reported in the survey match the register data and for 72% the sector reported matches. In fact, on the education level dimension, 93% of the respondents with a bachelor or master program as their highest level of education according to the registers report the correct level of education. Almost half of the respondents who report an incorrect educational level have a vocational education and

Figure 1: Example Survey Pages

(a) Eliciting perceptions of position

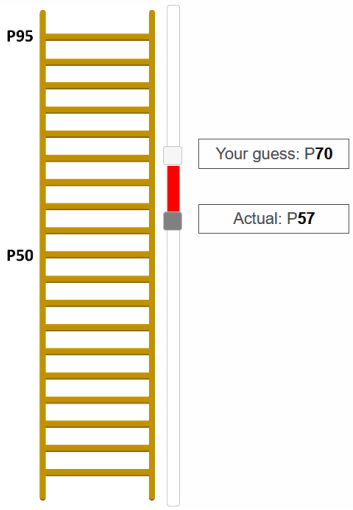
Rank among all people **born in 1970**

You previously reported that you had a yearly income in 2017 of 400000 DKK before tax. We will now ask you to report where you think this income placed you on the income ladder in 2017 for people who were born in 1970. Use the slider to select your position. Later, we will inform you about your true position.



(b) Information treatment (example of cohort reference group)

Rank among all people born in 1970
You GUESSED that you were on position P**70**.
Based on the income you reported, your TRUE position is P**57**.
You are actually 13 positions lower on the ladder than you thought.



(c) Question on Unfairness of Inequality

On a scale from 1 to 7 where 1 is "Completely fair", 4 is "Neither fair or unfair" and 7 is "Completely unfair", indicate to what extent you think that is fair or unfair that there are differences in income among people born the same year as you **WITHIN** the following groups that you are yourself a part of?

	Completely fair			Neither fair or unfair			Completely unfair
	1	2	3	4	5	6	7
Differences in income among people **born in 1970**	○	○	○	○	○	○	○
Differences in income among **men** born in 1970	○	○	○	○	○	○	○
Differences in income among people, living in **Københavns municipality**	○	○	○	○	○	○	○
Differences in income among people with the educational level **Master or PhD program**	○	○	○	○	○	○	○
Differences in income among people working in the sector **Finance and insurance**	○	○	○	○	○	○	○

Notes: Panel A shows the question eliciting the respondent's perceived position in the income distribution. In this example the respondent is born in 1970, has an income of 400,000 DKK and thinks they are in position 70. The slider is initialized at P1. Panel B shows part of the information treatment this respondent receives. The bottom panel shows a screenshot of the fairness of inequality question and illustrates how the reference groups are adapted (in bold) based on the respondent's earlier answers so as to ask directly about their reference group.

training program as their highest level of education. The majority of these respondents report their highest level of education as either upper secondary school or short cycle higher education. The explanation for the first group is that many consider upper secondary school as a higher level than vocational education, but according to the standard education classification this is not the case. For the second group, the majority have an education within *Office, commercial and business service*, and therefore plausibly think they have a short cycle higher education, but according to the education classification these are also categorized as vocational educations.

For the sector dimension, it is understandable that some respondents have difficulties in knowing the correct *label* of their sector, which is based on the standard classification and labelling of sectors as described in Table 2. For two of the large and well-defined sectors such as *Finance and insurance* and *Public administration, education, health and social activities* 89% and 91% of people in the sectors correctly report working in those sectors. In the smaller and less well-defined sectors such as *Culture, leisure and other services* and *Real estate activities* only 50% and 56% of people in the sectors correctly report working in those sectors. For instance, for *Real estate activities* more than half of those who report an incorrect sector, report working in either *Construction* or *Business service*. The discrepancies are thus likely attributable to genuine ambiguity, rather than to careless answers or misunderstandings.

The benchmark results we present use the reference groups respondents believe they belong to. Appendix E shows that the conclusions are unchanged if we instead use their actual reference groups or only include respondents who perceive their reference group correctly. This reflects that, to start with, the differences are not large across the groups that are difficult for respondents to differentiate between.

2 Perceptions of Social Positions

In this section, we describe people's perceptions and misperceptions of their own position in their cohort and their various large and small reference groups.

2.1 In the Cohort

We start with people's cohort. Our approach of asking about perceptions at the cohort level neutralizes life-cycle effects. This is both practically convenient and normatively more relevant. Arguably, large income variations due to life cycle effects are considered normatively less relevant than large income differences across similar, working-age people. Respondents in our chosen target cohorts are close to the peak of their career paths and income trajectories, with much of their permanent income already realized.[4]

[4]Appendix F highlights the pitfalls of asking about the full income distribution without specifying proper age limits. Both the P50 and P95 income by cohort varies drastically across different ages or by excluding or including some cohorts.

Perception of own position within the cohort. Respondents who are ranked lower in their cohort tend to think they are ranked higher, while those that are ranked higher tend to think they are ranked lower. This can be seen in Figure 2, which shows the relation between respondents' actual position in their cohort and their average or median perceived positions. d[5] The two curves both have a horizontal, inverted S-shape, whereby people below the median income level overestimate their position, while people above the median tend to underestimate it. Respondents that are close to the very top of the income distribution – a group that is typically missing from traditional surveys as discussed in Section 1 – quite accurately estimate their position.

In principle, misperceptions about one's position among others can stem from underlying misperceptions of one's own income or of the incomes of others. We discuss the role of misperceptions of others' incomes below but we can first rule out that misperceptions of own income play a major role. Respondents do not perfectly know their income (see Appendix Figure A-7), and those who misperceive their income are more likely to make larger errors in estimating their position (see Panel A of Appendix Figure A-9). However, Panel A of Figure 3 shows that there are no systematic misperceptions of income that vary by actual income. Furthermore, idiosyncratic misperceptions of own income are also not main drivers of the misperception of positions, as can be seen in Panel B of Figure 3. The figure shows that the relationship between perceived and actual positions is similar for those who perceive their income accurately (i.e. are within a 5% error band of the income observed in the administrative data) and those who do not. The interquartile range represented by the intervals is nevertheless larger for those with inaccurate income perceptions.[6]

Perceptions of the cohort income distribution. We now turn to respondents' perceptions of the cohort income distribution. Our first finding is that people are good at estimating median incomes, but less good at estimating top incomes. Panel A of Figure 4 plots respondents' misperceptions about the P50 income level (red curve) and the P95 income level (blue curve) relative to the actual levels. For the P50 income level, errors are symmetric around zero and bell-shaped. 45% of respondents estimate the median with at most a 10% error; 75% estimate it with at most a 25% error. For comparison, the errors when people report their own income (black curve) are such that 70% (respectively, 90%) percent report correctly within a 10% (respectively, 25%) error band.[7] Against this benchmark, people seem reasonably well aware of the P50 income level of others in

[5] Appendix Figure A-8, Panel A shows that if we compute the actual position in different ways using the average income on the tax return over the last three years (to reduce the role of potential noise and large fluctuations in actual position) or the reported income in the survey, the pattern is the same. Panel B of Appendix Figure A-8 depicts the 25th percentile and the 75th percentile by actual position. It reveals more variation in perceived position of people in the very bottom of the distribution relative to those at the very top.

[6] Panel B of Appendix Figure A-9 shows that respondents who report a 10,000 DKK higher income (than their actual income) on average report a 1000 DKK higher median income in the cohort. Panel C then shows that a respondents who reports an income that would imply they are 10 ranks higher than their actual position overestimate their actual position by 6. Therefore, these misperceptions tend to cancel out. Furthermore, idiosyncratic errors in own income would not, in general, generate the distribution of perceived positions observed in Appendix Figure A-10.

[7] Regarding this comparison, note that the spike at exactly zero in Appendix Figure A-7 suggests that many of the respondents have checked their actual income on the tax return when answering the survey. It is not possible to similarly easily find information about the median of a cohort.

their cohort. As compared to the perceived P50, there is larger variance of the perceived P95 level and a small majority of people underestimating its level.

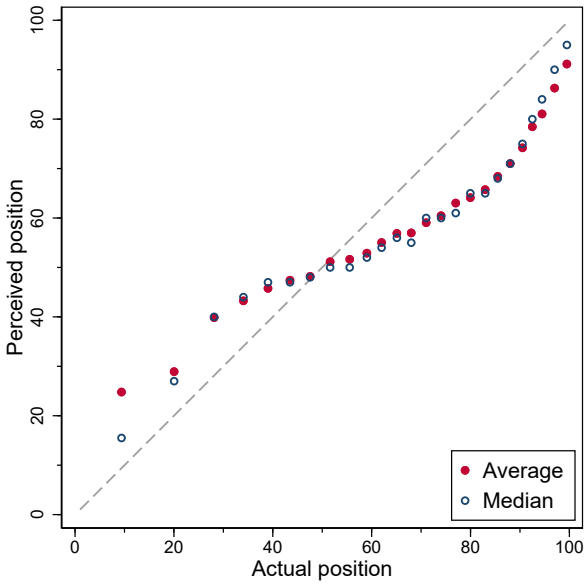
Our second finding is that people's own income influences their views on the median and the 95th percentile income: those who have lower income tend to think that the incomes of others are lower, while those with higher income tend to think incomes are generally higher. To see this, consider Panels B and C that reveal an increasing relationship between the average perceived P50 and P95 income levels and the respondent's own position in the distribution. Higher-income respondents tend to over-estimate the P50 and lower-income people to underestimate it. Yet, except for respondents in the very top and the very bottom of the distribution, the average prediction errors at each percentile are within 5% of the actual P50 value.[8] At most income levels up to percentile 95, the average perception error for the P95 is below 10%. By contrast, those in the very top of the distribution starkly overestimate the P95 by 50%.

What explains misperceptions of own position? Returning to the question of what causes respondents' systematic misperceptions of their own position, we can see that errors in assessing others' incomes plays an important role. Respondents' misperceptions of others' incomes are systematically correlated with their own income: they tend to think others' incomes are higher when their own income is higher. In short, people who are in lower positions rank themselves higher relative to others not because they misperceive their own income, but because they tend to underestimate the incomes of others. Conversely, people who are higher-ranked tend to place themselves at lower positions because they overestimate the incomes of others.

Which respondents are most accurate? In addition to actual cohort position, what are the characteristics that drive respondents' perceptions and misperceptions? Table A-4 regresses measures of accuracy and inaccuracy of perceived position, P50, and P95 on indicator variables capturing the respondents' gender, political views, area of residence, education level, and sector of work as well as cohort fixed effects and actual income position fixed effects. We find that more educated respondents and male respondents are significantly more likely to be accurate across all domains (own position, P50, and P95). Characteristics related to area of residence and sector of work are not strongly associated with misperceptions.

[8] Equivalently, in terms of positions, an income level 5% below the actual median (DKK 350,000) corresponds to a percentile position of 44-45 within the cohorts and an income level 5% above (DKK 400,000) corresponds to a percentile position of 56-57.

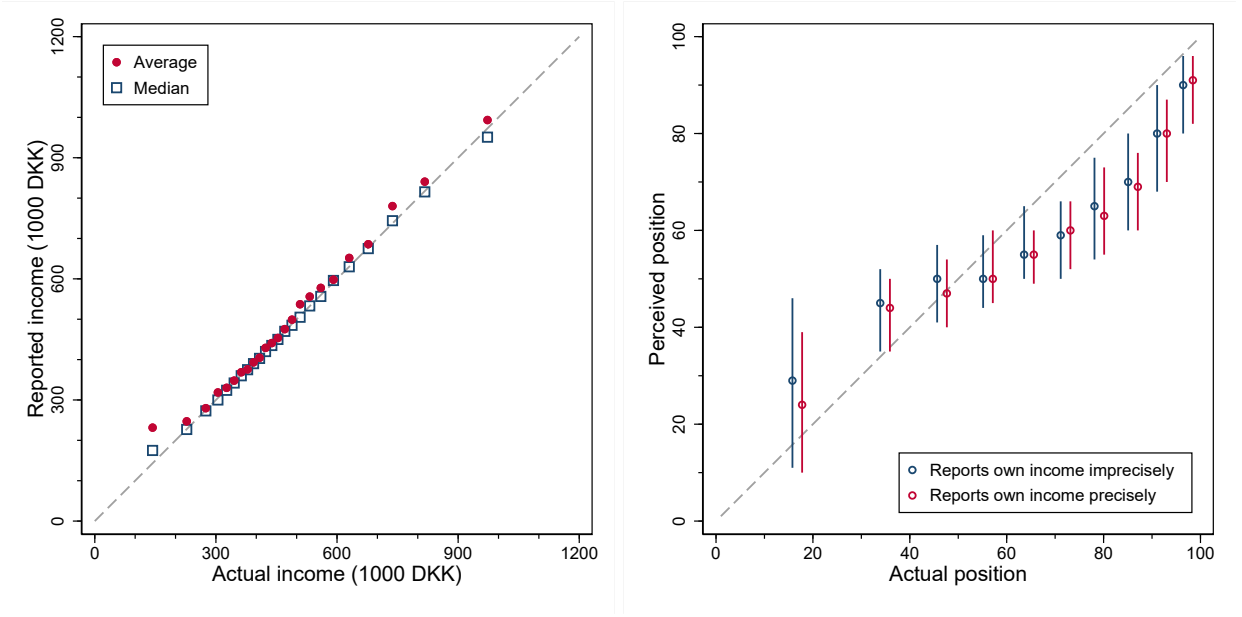
Figure 2: Perceived vs. actual position in the cohort



Notes: The figure shows a bin scatter of the average and median perceived position by actual position in 25 equally-sized bins. Actual position is based on the income from the tax return.

Figure 3: Misperceptions of own income

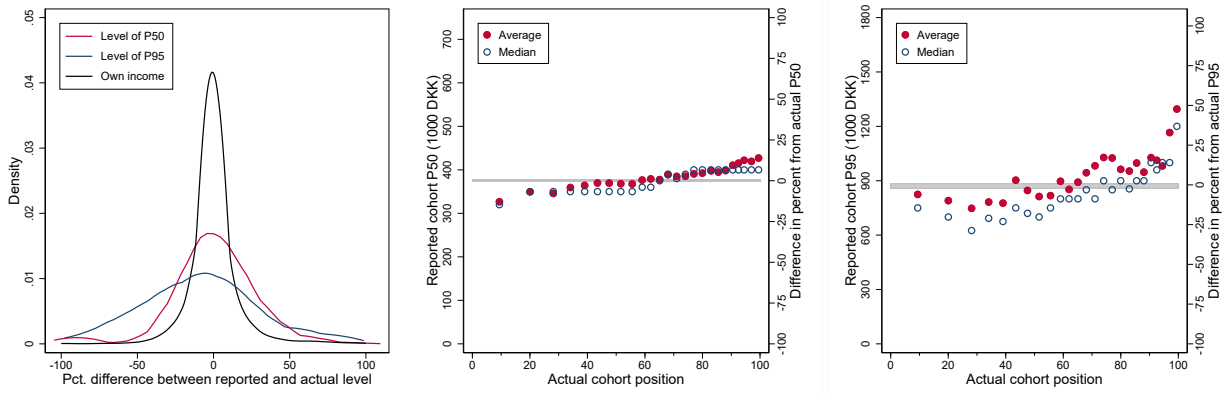
(a) Actual vs. reported income (b) Perceived vs. actual position



Notes: The left panel shows binned scatter plots of the average and median reported income against actual income (measured in 1000 DKK). The 25 bins have approximately the same number of respondents. The right panel replicates the plot in Figure 2 by showing the median perceived position by actual position, but splits the sample into people whose perceived income is within a 5% error band of their actual income, *Reports own income precisely*, and those whose perceived income is more than 5% above or below their actual income, *Reports on income imprecisely*. The intervals show the interquartile range.

FIGURE 4: PERCEIVED P50 AND P95 OF THE COHORT

(A) SIZE OF MISPERCEPTIONS (B) P50 MISPERCEPTION (C) P95 MISPERCEPTION



Notes: Panel A shows the distribution across respondents of the misperception in percent of the level of P50 and P95 (i.e., the percent difference between perceived and actual levels). For comparison, we plot the misperception of the respondent's own income as reported in the survey and their actual income on the tax return. The distributions are smoothed using epanechnikov kernels with a bandwidth of 5 for *Own income*, 10 for *Level of P50* and 15 for *Level of P95*. Panel B (respectively, Panel C) is a bin scatter with 25 bins of the average and median perceived P50 (respectively, P95) reported in DKK (left scale) and the corresponding misperception in percent (right scale) by actual position in the within-cohort income distribution. The perceived P50 and P95 are winsorized at the 5th and 95th percentiles within each bin (the median is unaffected by this).

2.2 In Large Reference Groups

Are respondents well-aware of the income distributions of various reference groups? On average, respondents estimate the median income level of their various reference groups – cohort, education, sector, municipality, gender – very well. They also assess the P95 of their cohort, gender, and municipality accurately, but significantly underestimate the P95 of their education group and their sector of work. Thus, respondents are not well-aware of the extent of income differences among people with the same education and among those working in the same sector.

To see these results, consider Panel A of Figure 5, which plots the average perceived P50 for different reference groups of respondents in those groups against the actual P50. Each point represents either the overall cohort, a gender group, an education group, a sector, or a set of municipalities. For example, the two red dots show how men perceive the P50 of men and how women perceive the P50 of women. Municipalities, which are too numerous to be plotted individually, are grouped into ten bins defined by median municipality income. Many points are closely aligned with the 45 degree line, suggesting that individuals are relatively well aware of these two moments of the whole cohort distribution (black point), the gender-specific distribution (red points) and the municipality-specific distribution (blue points). Misperceptions of the P50 are largest for the two sectors with the highest median income levels, namely "Finance & Insurance" and "Information & communication." In those sectors, respondents tend to underestimate the median income.[9] Panel B shows the perceived P95 levels for the different reference groups. Respondents in general underestimate the top incomes in these reference groups. In particular, the green and purple points in the right panel, representing individuals' sectors and education groups, are all below the 45 degree line. Thus, respondents do not appreciate the degree of inequality within their education groups and within their sectors.[10] Panels B and C of Appendix Figure A-11 shows these patterns also hold if we use group medians instead of averages. The full distributions of P50 misperceptions can be seen in Panel A of Appendix Figure A-11. They are similar across reference groups and mirror the distribution of misperceptions of the cohort P50 from Figure 4.

How do people's perceptions of others' incomes depend on their own income? The average perceptions just described obscure significant heterogeneity by income level. In each reference group, respondents who are ranked lower underestimate the median and top incomes in that group, while respondents who are ranked closer to the top overestimate the median and top incomes.

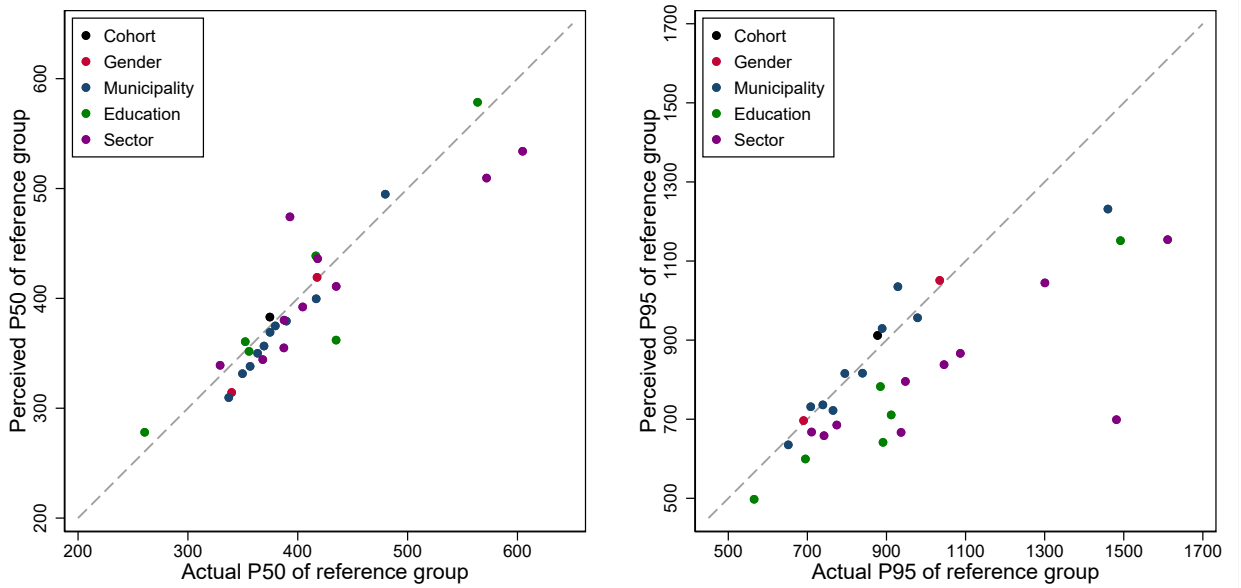
To zoom in on these findings, Figure 6 shows the perceived P50 levels for different large reference groups as a function of respondents' actual positions, split by type into each panel (gender, municipality, education, and sector of work). In Panel A, the horizontal lines represent the P50

[9] "Information & communication" covers a wide range of industries, from computer programming to the publication of newspapers. It does not include advertising or marketing.

[10] The outlier in the lower-right corner is the sector "Agriculture, forestry and fishing." This is a small sector in Denmark measured by the number of employed people in the sector and we only have 80 respondents in our sample that work in this sector. Furthermore, it is a sector with large income inequality: the P50 income level is the lowest of the ten sectors, yet it has the second highest P95 income level.

FIGURE 5: PERCEIVED AND ACTUAL P50 AND P95 LEVELS OF LARGE GROUPS

(A) P50 (B) P95



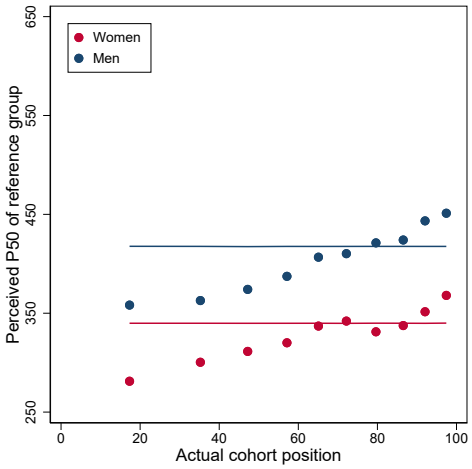
Notes: For gender, we show one point for men and one for women. For municipality we divide the respondents into 10 similar sized groups based on the actual municipality P50 and P95 income and plot one point for each group. Each education level and sector are also represented by one point. The points show the means of the reported P50 or P95 by respondents in that group, winsorized at the 5th and 95th percentiles within the group.

income level of men and women. The dots show the average perceived P50 level of their gender group among men and women, by bins of actual cohort position. Conditional on being at the same income position in their cohort, men correctly report a higher P50 income than women for their own gender group. The vertical distance between the estimates of men and women at the same cohort position is very close to the actual difference between the P50 incomes. Yet, there is a systematic bias in perceptions as was observed for the cohort in Figure 4: high-income men and women overestimate the P50 income level of their gender group, while lower-income men and women underestimate it.

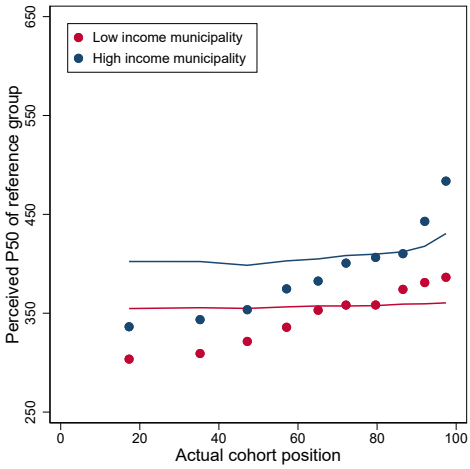
In Panel B, we split respondents into two roughly equally-sized groups, depending on whether they live in a low-income or high-income municipality. For each of these two municipality groups and each bin of actual cohort position, we plot the average perceived P50 income of respondents and the average actual municipal P50 income. We repeat the same procedure for education groups and sectors (Panels C and D). For all reference groups, we observe that people belonging to a high income group consistently report a higher P50 for their group than people belonging to the corresponding low-income group. For the municipality and education reference groups, the differences in perceptions between low-income and high-income groups (i.e., the distances between the blue and red dots) tend to be somewhat smaller than the actual differences (i.e., the distance between the red and blue lines) except towards the top of the distribution, while for the sector reference group these differences in perceptions are much smaller, i.e., much more compressed, than the ac-

FIGURE 6: PERCEIVED AND ACTUAL P50 LEVELS BY COHORT POSITION

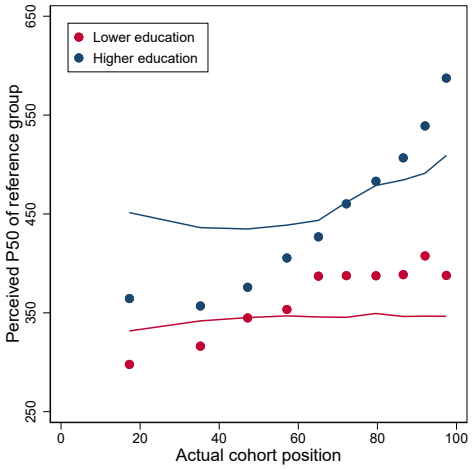
(A) GENDER



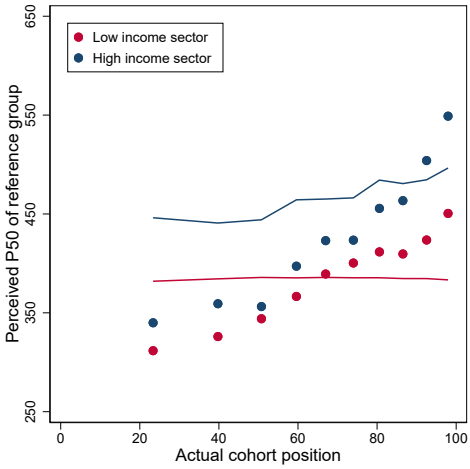
(B) MUNICIPALITY



(C) EDUCATION



(D) SECTOR



Notes: The solid lines indicate the actual average P50 income of their reference group for respondents grouped into bins by actual cohort positions. The dots indicate the bin average of perceived P50 income of the reference group. Municipalities and sectors are classified into two equally-sized groups based on their P50. The *Higher education* category includes short cycle higher education, bachelor programs, and master programs.

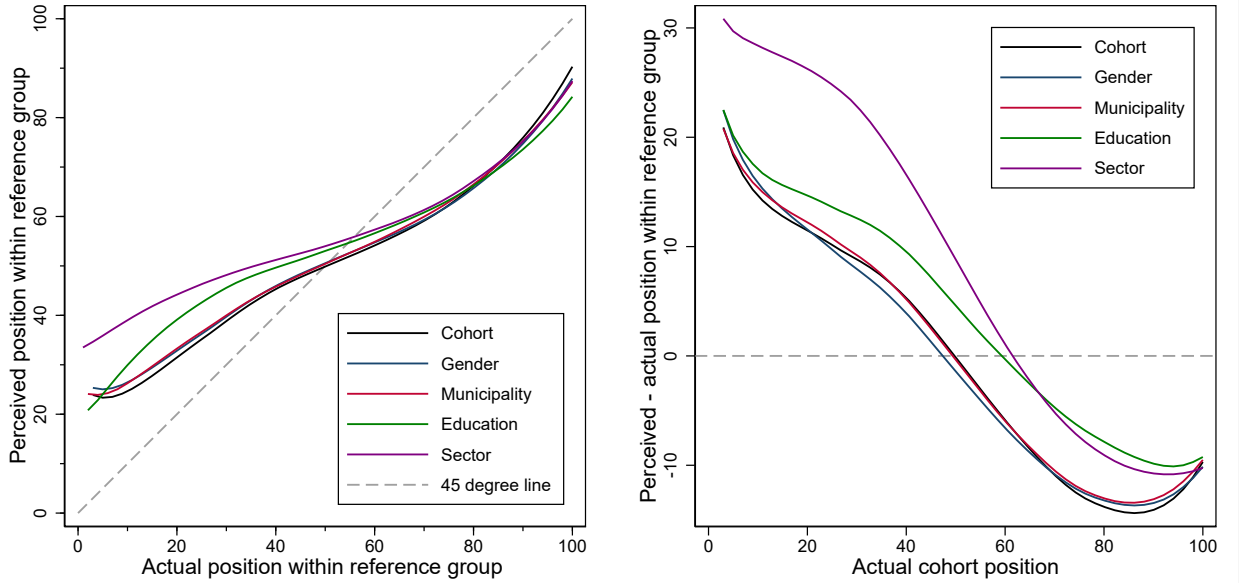
tual differences. To a large extent, this reflects the fact that people with low and middle incomes working in high-income sectors tend to significantly underestimate the P50 of the sector.

Perceptions of own position in different reference groups. In all reference groups, people in the lower part of the income distribution tend to overestimate their positions, while people in the upper part tend to underestimate their positions. The misperceptions are largest for the sector of work and education group, in which people ranked in the lower part starkly overestimate their positions.

Figure 7 illustrates these findings. Panel A plots respondents' perceptions of their own position within each reference group as a function of their actual position within that group. To better

FIGURE 7: PERCEIVED AND ACTUAL POSITION WITHIN LARGE REFERENCE GROUPS

(A) BY REF. GROUP POSITION (B) BY COHORT POSITION



Notes: Panel A plots perceived position within each reference group as a function of actual position in that reference group. Panel B plots misperception of position in reference group by cohort position. The local linear polynomials have a bandwidth of 10. We use reported reference groups both for actual and perceived positions.

compare the different reference group positions, we show local linear polynomials for each group in the same plot. The familiar S-shaped curve is visible here too. Panel B recasts this information in a different way, by plotting respondents misperception of their reference group positions for given overall position *in the cohort*. At all income levels, people tend to be most overoptimistic about their position in their education group and their sector. For example, people at the 20th percentile among their co-workers on average think they are well above the 40th percentile, while people at the 20th percentile in their municipality believe they are around the 30th percentile.

These patterns of misperceptions of own position are in line with our finding that people in general tend to underestimate the inequality in their sector (as reflected by their underestimation of the P95), and that people in the lower part of the distribution significantly understate the P50 income level of their sector. As for the cohort, respondents' misperceptions of their own position are mainly driven by their erroneous assessment of others' incomes, in a way that is systematically correlated with their own income.

Extensions. Two additional pieces of evidence support the descriptive findings in this section. First, we may wonder to what extent respondents report similar positions across different reference groups. They may do so out of carelessness, fatigue, or because they do not appreciate the distinctions between the groups. Appendix Figure A-12 shows that this is not the case. For each perceived position in the overall cohort distribution, we observe significant variation in perceived reference group positions. The bottom row also shows that for any given misperception of the

cohort position, the misperceptions of positions in the other groups vary substantially.

Second, there is a positive correlation between actual positions in the various reference groups and, hence, it is to be expected that respondent's perceptions of their positions are also correlated across groups. However, respondents' perceptions systematically exhibit the center bias pattern described above and, hence, perceived positions are more correlated across reference groups than actual positions. Consider Appendix Figure A-13, which shows respondents' actual position for each large reference group (top panels) and perceived position (bottom panels) as a function of their actual positions within the cohort. We split respondents into high-income reference groups (blue dots) and low-income reference groups (red dots), which both represent roughly half of the sample.[11]

Take the example of gender groups. The top left panel shows that men's position in the cohort is higher than their position among other men, while the women's position is lower than their position among other women. The bottom left panel shows that the differences in the perceptions of men and women about their positions in the respective reference groups are smaller than the actual differences. For the other reference groups, we see a similar pattern. The differences in perceptions between high- and low-income groups are most compressed for education and sector in line with the result for the perceived median. Furthermore, the differences in perceptions of own position in a group are more compressed than perceptions of the P50, consistent with the center-bias highlighted.

2.3 In Small Reference Groups

In this section, we study perceptions related to smaller reference groups that may be close to a respondent's daily life and potentially easy to relate to: co-workers at the same workplace, neighbors living on the same road (if living in a house) or stairwell (if living in an apartment), former schoolmates, and parents. The center bias is also apparent for small reference groups and is of varying magnitude. Respondents' misperceive their position among their current co-workers more strongly than among their neighbors, which is reminiscent of their misperceptions related to their sector of work being larger than that related to their municipality. They even tend to make smaller errors when ranking themselves among their former schoolmates during their teenage years than when ranking themselves among their current co-workers.

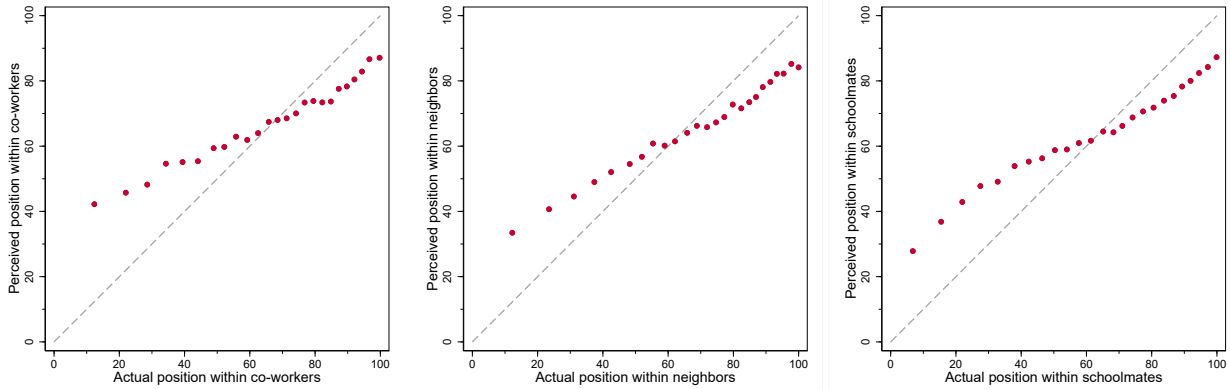
Recall from Section 1 that for each group, we first asked the respondent about the perceived number of individuals in the group (N) and then asked them to report their perceived income position (X) on a horizontal slider going from 1 to N. We compute the perceived percentile rank as $\frac{X}{N} \cdot 100$ and the actual percentile rank using the true X and N from the register data. Figure 8 shows how people rank themselves among co-workers, neighbors, and former schoolmates.

The graph of the perceived position among co-workers at the same workplace in Panel A is

[11] This is reminiscent of Figure 6, which focuses on the P50 of the reference group, while the current figure focuses on the individual's own position.

FIGURE 8: PERCEIVED POSITION WITHIN SMALL REFERENCE GROUPS

(A) CO-WORKERS (B) NEIGHBORS (C) SCHOOLMATES



Notes: The panels depict the average perceived position of respondents among their co-workers in the same firm, their neighbors, and their former schoolmates, as a function of their actual position within these groups. There are 25 equally-sized bins in each panel.

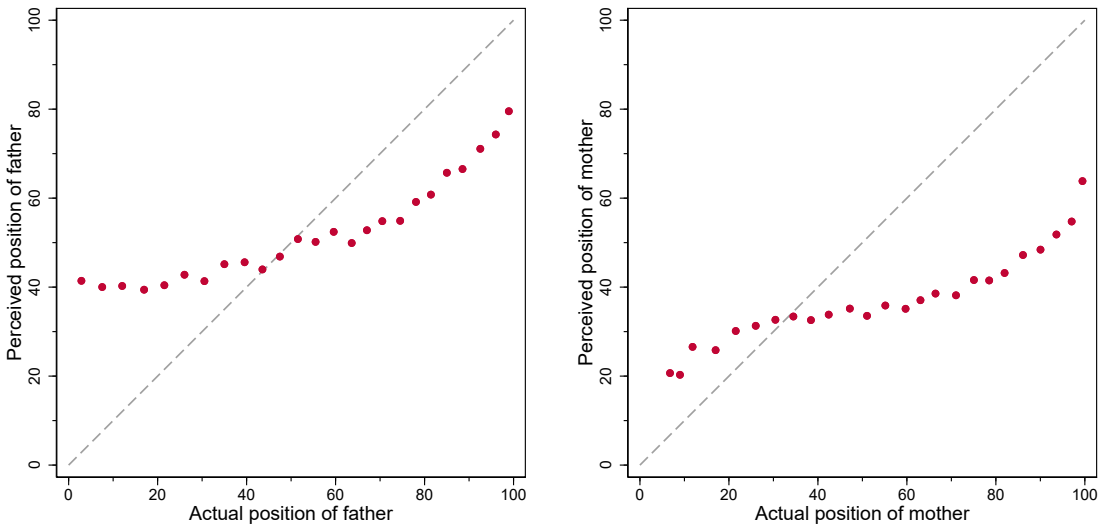
very similar to the result for perceived position among co-workers in the same sector in Figure 7. In both cases, people who are in the bottom of the distribution believe that they are much higher up than they truly are, e.g., respondents at the 20th percentile among co-workers in the same firm or sector on average believe that they are above the 40th percentile in those groups. In the upper part of the distribution people underestimate their positions, but the misperceptions are smaller than in the bottom. The graph of the perceived position among neighbors in Panel B shows smaller misperceptions at the lower part of the distribution. The conclusions are thus consistent for large and small reference groups: misperceptions at the bottom are larger when people compare themselves to co-workers in either their sector or form than when they compare themselves to people living in their area, either in their city or immediate vicinity. The graph of the perceived position among schoolmates in Panel C also has the same shape and exhibits lower errors than the graph for co-workers.[12]

In Section 3, we will correlate fairness views with the past positions of respondents and that of their fathers. It is thus informative to check whether respondents are aware of where their parents used to rank. Figure 9 shows the perceived positions of parents of the respondents, when the respondents were fifteen years old, as a function of the true position in the ranking of parents of children from the same cohort. The line is close to flat for the ranking of fathers in Panel A, except for fathers who were ranked in the top 25%, indicating that respondents have little idea about the

[12]A deviation between perceived and actual rank could reflect that people misperceive the number of people belonging to their refererence group rather than their own position within the group. In Appendix Figure A-14, we show that respondents are well aware of the size of their reference groups. The exception is a small share of respondents who have more than one hundred neighbors and underestimate that number. Appendix Figure A-15 shows that we obtain similar results if we restrict the analysis to respondents whose reported number of people in the small reference group matches the number observed in the register data within a 10% error band or if we use bin medians instead of bin averages. In addition, Appendix Figure A-15 shows similar patterns for co-workers and for neighbors if we split the respondents into people working in small firms versus large firms and into those living in apartments versus houses.

FIGURE 9: PERCEIVED POSITION THE RESPONDENT'S PARENTS

(A) FATHER (B) MOTHER



Notes: We asked about the respondents' perceived position of father's or mother's position when the respondent was 15 years old relative to parent's of other children from the same cohort as the respondent. We asked men about their father's position and we asked women about their mother's position. The right panel only includes responses from people reporting the correct number of siblings. *Actually higher* means that a respondent's income is at least 25 pct. higher than the siblings' mean income. *Actually lower* means that a respondent's income is more than 25 pct. below the siblings' mean income.

income positions of their fathers. Respondents are also unaware of their mother's positions and starkly underestimate it, including at the very top.

3 Relationship Between Social Positions and Fairness Views

How do views on fairness vary with social position? We approach this question in four ways. First, we study the contemporaneous correlations between social position and fairness views within and across reference groups. We then leverage our data on respondents' past income histories to relate fairness views to overall changes in social position over the lifetime and to specific changes in social position caused by major life events such as unemployment, health shocks, disability, and promotions. Finally, we analyze how fairness views are causally affected by changes in perceived social positions induced by our information treatment.

As described in Section 1.2, we study three types of outcomes: views on the fairness of inequality within each reference group, the belief that effort matters more than luck for differences in income within a reference group, and right-wing support represented by support for political parties that vary from left-wing to right-wing. The "unfairness (of inequality)" variable for each reference group ranges from 1 (inequality within the group is considered completely fair) to 7 (inequality within the group is considered completely unfair). The perceived "importance of effort (relative to luck)" variable measures to what extent a respondent believes that differences in income are caused by

differences in people's effort or rather by luck on a scale of 1 (only luck matters) to 7 (only effort matters).

The "Right-wing" variable is based on the party that the respondent plans to vote for if there was a general election today. They could choose among 11 parties and the two other options, "Other" and "Do not wish to answer" for a total of 13 options. To classify parties into left- and right-wing in an objective, data-driven way, we take the control group respondents and use their answers to the economic policy view question to rank these 13 options based on the average economic policy views of respondents. The party ranked 1 has voters in the survey who on average report to be most left-wing while the party ranked 13 has voters in the survey who on average report to be most right-wing.[13]

In our benchmark regressions, we standardize the outcome variables into z-scores by subtracting the control group mean and dividing by the standard deviation. As a robustness check, we show the results are similar if we use indicator outcome variables throughout instead of categorical ones (see Appendix G). We also consider additional outcomes such as life satisfaction or support for redistribution in Appendix D.

3.1 Fairness Views Within and Across Reference Groups

How fair do people think income differences within the various reference groups are, and how do their views vary with their own position in those reference groups? Panel A of Figure 10 plots the perceived unfairness of inequality for each reference group against the perceived position in that reference group. Those who think that they are ranked higher in a given reference group believe that inequality within that group to be less unfair. Furthermore, views on how fair inequality is for the cohort, gender, and municipality reference groups are similar and exhibit an analogous relation to respondents' position. On the contrary, income inequalities within education and sector groups are considered more unfair at all positions in the distribution. Panel B shows that those positioned higher within the different reference groups also tend to believe that income differences in these groups are the result of effort rather than luck. In this dimension, there is no major difference between reference groups either on the level or the slope.[14] The same patterns hold if we plot the outcomes against actual (rather than perceived) position within each reference group on the x-axis (see Appendix Figure A-16, which also shows the distribution of the outcomes by reference group).

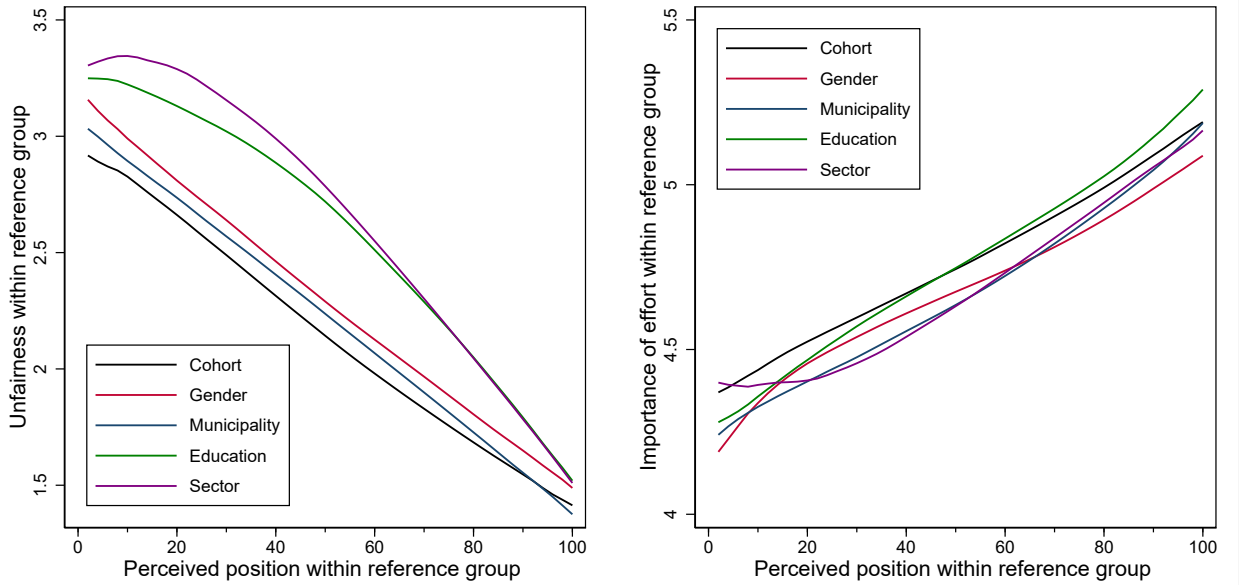
Figure A-18 shows the relationship of several other outcome variables with perceived position. Respondents who are ranked higher in their cohort tend to think inequality in Denmark as a whole is less of a problem, support less redistribution, are more satisfied with their life, believe their own work has paid off, and think that high income earners deserve their income.

[13] This data-driven ranking of parties aligns almost perfectly with the subjective ranking of the Danish parties by fourteen experts in Green-Pedersen and Kosiara-Pedersen (2020). For robustness, we verify that our results hold if we directly use the answers to the question on economic policy views rather than party support where this is possible (see Appendix H for the full set of tables and figures).

[14] Appendix Figure A-17 shows the distribution of responses to these questions and other outcomes.

FIGURE 10: UNFAIRNESS OF INEQUALITY AND IMPORTANCE OF EFFORT ACROSS LARGE REFERENCE GROUPS

(A) UNFAIRNESS OF INEQUALITY (B) IMPORTANCE OF EFFORT



Notes: The left panel plots the unfairness of inequality variable (locally linear polynomials with bandwidth 20), which is on a scale of 1 (completely fair) to 7 (completely unfair). The right panel plots the perceived importance of effort on a scale of 1 (only luck matters) to 7 (only effort matters). The sample is restricted to respondents in the control group only.

Table 3 confirms the graphical analysis in Figure 10 without controls (Panel A) and with fixed effects for cohort, gender, municipality, educational level, sector of work, and employment status (Panel B). The last column shows the third main outcome, i.e., right-wing political views. Outcome variables are standardized into z-scores by subtracting the mean and dividing by the standard deviation of the control group sample. The "Outcome mean" row shows the average, non-standardized fairness views by reference group and highlights the different levels of perceived unfairness across reference groups. The means confirm that education and sector-level income differences are considered significantly more unfair than inequality overall within cohort or within other reference groups.

The inclusion of controls does not affect the results substantially. A higher position in the cohort and a higher positive misperception of it significantly correlate with weaker perceived unfairness of inequality, a stronger belief in the role of effort over luck, and a higher likelihood of voting for a right-wing party. The precisely estimated coefficients on actual position show that, across reference groups, moving up by 10 positions in the income distribution is correlated with a 0.12-0.14 standard deviation increase in perceived unfairness. These are substantial effects, equal to around one third of the gap in perceived fairness between respondents who voted for left-wing parties (*Rød blok*) and those who voted for right-wing parties (in Danish *Blå blok*) in 2015. The effects of moving up in misperceived rank across the reference groups are smaller, i.e., around 30-60% of the effects of

Table 3: Unfairness, importance of effort and political view by actual position and position misperception

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Panel A: No controls							
Position	-1.18***	-1.13***	-1.27***	-1.36***	-1.42***	0.82***	0.90***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Misperception	-0.38***	-0.61***	-0.48***	-0.38***	-0.86***	0.44***	0.49***
	(0.10)	(0.09)	(0.09)	(0.08)	(0.09)	(0.10)	(0.10)
Panel B: With controls							
Position	-1.09***	-1.01***	-1.09***	-1.03***	-1.19***	0.92***	0.99***
	(0.09)	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)	(0.08)
Misperception	-0.40***	-0.41***	-0.42***	-0.30***	-0.61***	0.47***	0.54***
	(0.10)	(0.10)	(0.09)	(0.09)	(0.09)	(0.10)	(0.10)
N	4692	4692	4692	4692	4452	4692	4692
Outcome mean	2.01	2.16	2.09	2.54	2.53	4.81	7.10
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)

Notes: The sample is restricted to control group respondents. All outcomes are as defined in the text, but standardized to z-scores. *Position* denotes the actual position within the reference group from percentile 1 to 100 divided by 100. A coefficient of 1 means that going from the bottom of the distribution to the top increases the outcome by one standard deviation. Similarly, *Misperception* is the difference between perceived and actual position within the reference group divided by 100. In the last two columns, the position and misperception are computed in the distribution of the cohort. *Controls* are cohort, municipality, education, gender, and sector fixed effects (including unemployed/not in workforce). *Outcome mean* is the mean of the non-standardized outcome variable. Standard errors on the estimates are reported in the parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

moving up in actual rank, but they are still significant and sizable.[15]

3.2 Historical Variation in Social Positions

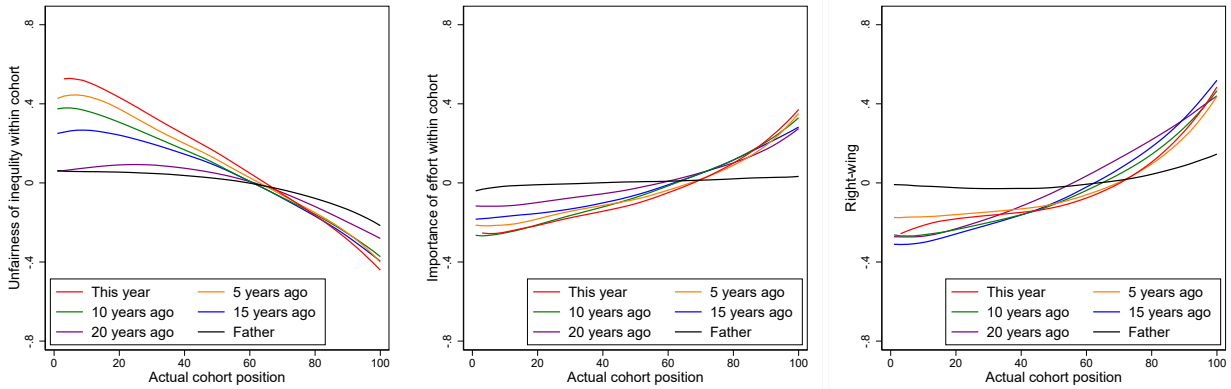
What is the relative importance of current social position and social positions back in time in shaping views on fairness, the role of effort, and political affiliation? To address this question, we make use of the rich register data to reconstruct people's income and economic histories for the last twenty years and correlate them with their views today. We first focus on their overall income path and then consider at the effects of changes in social position due to specific negative and positive shocks.

Figure 11 plots respondents' views against their position in their cohort, measured at different points in time in five-year intervals, as well as against their father's position relative to other fathers in the cohort, measured when the individual was 15 years old. Panel A depicts the standardized (z-score) unfairness variable, i.e., the extent to which within-cohort income differences are considered

[15]See Appendix Table A-5 for other outcomes related to inequality views.

FIGURE 11: HISTORY OF PAST SOCIAL POSITIONS, UNFAIRNESS, IMPORTANCE OF EFFORT, AND POLITICAL VIEWS

(A) UNFAIRNESS (B) IMPORTANCE OF EFFORT (C) RIGHT-WING



Notes: Bandwidth for local linear polynomials is 20. For *Father*, the x-axis is the father's position among fathers when the respondent was 15 years old. The outcomes are standardized z-scores of the unfairness variable, perceived importance of effort relative to luck, and right-wing political views. Sample restricted to the control group.

unfair. This association between current fairness views and social position becomes weaker when measuring social position at more distant points back in time. Their father's social position is essentially uncorrelated with respondents' current fairness views.[16]

Panels B and C show how the perceived importance of effort relative to luck and support for right-wing parties relate to social positions over time. These links appear more stable regardless of the time at which social position is considered, suggesting that these are stickier outcomes.[17]

To understand whether one's history of social positions over time is correlated with fairness view conditional on current position, each column in Table 4 shows the regression coefficients of the variables in the columns on positions 20, 15, 10 and 5 years ago, as well as current position, and controlling for cohort, gender, education, sector, and treatment fixed effects. The table shows that current social position las a larger correlation with fairness views than with political views. Some of the historical positions are also significantly related to fairness views, but less strongly than current views. Political views are related to current and past positions and even the position of the father, conditional on the individual's own historical positions. Views on the importance of effort are correlated most strongly with current position and more weakly so with past positions. Appendix Tables A-8 and A-9 show that these findings are unchanged if we omit the controls or use average positions over five-year intervals instead of positions in a given past year.

[16]Recall from Section 2 that perceived and actual position are relatively closely aligned for most respondents. Thus, although we do not have respondents' history of perceived positions (as opposed to actual positions), it is likely that these have co-moved to a significant extent over the life time.

[17]These results need to be interpreted in light of the degree of income mobility over different time spans. Appendix Tables A-6 and A-7 show that, naturally, the correlation between the current social position and past positions decreases as we move back in time. If we think of position as having a permanent and a transitory component, then the results are consistent with political views being mostly related to the permanent component and fairness views mainly being related to the current position, i.e., the sum of the permanent component and the current transitory component.

Table 4: History of past social positions, unfairness, importance of effort, and political view

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Position father	-0.059	-0.051	-0.068	-0.081*	-0.075*	0.025	0.147***
	(0.037)	(0.037)	(0.037)	(0.036)	(0.037)	(0.037)	(0.035)
Position -20 yr.	-0.122**	-0.097*	-0.108**	-0.113**	-0.131**	0.061	0.263***
	(0.042)	(0.041)	(0.041)	(0.040)	(0.041)	(0.042)	(0.039)
Position -15 yr.	-0.203***	-0.169***	-0.148**	-0.126**	-0.139**	0.131**	0.268***
	(0.048)	(0.048)	(0.048)	(0.047)	(0.048)	(0.049)	(0.046)
Position -10 yr.	-0.085	-0.100	-0.117*	-0.186***	-0.162**	0.206***	0.163**
	(0.058)	(0.057)	(0.057)	(0.056)	(0.057)	(0.058)	(0.055)
Position -5 yr.	-0.108	-0.096	-0.152*	-0.108	-0.130	0.037	-0.015
	(0.070)	(0.068)	(0.069)	(0.067)	(0.069)	(0.070)	(0.066)
Position this yr.	-0.655***	-0.618***	-0.647***	-0.678***	-0.761***	0.540***	0.479***
	(0.074)	(0.073)	(0.073)	(0.071)	(0.074)	(0.074)	(0.070)
Observations	9046	9046	9046	9046	8575	9046	9046
Controls	✓	✓	✓	✓	✓	✓	✓

Notes: All outcomes are z-scores. *Position* denotes the cohort position from percentile 1 to 100 divided by 100. A coefficient of 1 means that going from the bottom of the distribution to the top increases the outcome by one standard deviation. *Importance of effort* is for income differences within cohort. *Position father* is the respondent's father's income rank when the respondent was 15 years old compared to other fathers of 15 year olds. *Controls* includes a treatment indicator, cohort, municipality, gender, education, and sector fixed effects (including unemployed/not in workforce). Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

3.3 Variation in Social Positions due to Life Events

We now consider four life events – negative and positive – that can affect people: unemployment spells, disability, unexpected health conditions that require hospitalization, and promotions at work.

We focus on the last ten years before the survey and split those years into two: the "pre-shock period" is defined as the first 4 years (2008-2011) and the "shock period" comprises the 6 most recent years (2012-2017). For each of the four shocks, we perform the analysis on the subsample of individuals who did not experience this shock in the pre-shock period and define an indicator variable equal to 1 if an individual experienced the shock at some point during shock period. We regress our outcome variables on each shock indicator (one at a time) and detailed individual level controls including fixed effects for cohort, gender, municipality, education, sector, and percentile cohort position prior to the shock.[18] Thus, the question we are asking is: conditional on starting

[18]The unemployment shock is defined as three or more months of unemployment in at least one year in the shock period. To study its effect, we focus on respondents who were in the workforce for the entire ten-year period. A disability shock is defined as a respondent starting to receive disability insurance benefits (without having received it before) in one of the years in the shock period (according to the official Integrated Database for Labour Market Research, IDA, from Statistics Denmark). Hospitalization refers to at least one emergency room visit or hospital visit by referral from a general practitioner, excluding visits due to congenital diseases, pregnancy, or routine checks, which do not reflect unexpected health shocks. Finally, a promotion is defined as a respondent switching from a job as a regular employee in the pre-shock period to a management position in the following period. Note also that we do

from the same position ten years ago, and conditional on an array of personal characteristics, do respondents who experienced one of these four shocks shifting their social position hold different views today from those who did not?

Table 5 shows the results. Each row represents a separate regression, one for each of the four shocks. Column 1 presents the effect of the shock on current social position; columns 2 through 8 show the impacts on our usual outcomes; column 9 reports the size of the sample in each regression; and column 10 indicates the share of respondents affected by the shock during the shock period. The shocks differ in their frequency and impact. Unemployment and promotions affect 5-7 percent of the sample and are related to relatively large changes in social position (in opposite directions). Disability shocks are rare, but entail very large drops of around 22 percentiles in social position. By contrast, half of the sample visits the hospital unexpectedly during the shock period, and this is associated with a small 2-percentile drop in social position.

Respondents who have experienced any of the negative shocks (unemployment, disability, and hospitalization) are significantly more likely to consider inequality within various reference groups unfair. To the contrary, those who have been promoted are less likely to consider inequality unfair, especially within sector, which is the domain most closely related to work promotions. The shocks that move social positions the most (i.e., disability and unemployment) have the largest effects on fairness views. Consistent with our previous results, the effects of the shocks are weaker and less significant on the perceived importance of effort relative to luck and on right-wing views.

Of course, these effects are not necessarily causal, since these life events may be correlated with other unobservable characteristics of the respondents that also affect their views. Nevertheless, the detailed controls and fixed effects (including for the starting position ten years ago) likely absorb a substantial share of heterogeneity. In fact, we obtain similar effects if we omit individual level controls except for starting position (see Appendix Table A-13), suggesting that there is no systematic correlation between these individual characteristics and life events. It is also informative that we are able to study four different types of shocks, with some that could be perceived as more exogenous to individual choice, conditional on a detailed set of controls (e.g., hospitalization or disability).

We can also do an IV-type analysis, in which we instrument for current position using the occurrences of these shocks. The exclusion restriction needed for this strategy to correctly identify the effect of social position on fairness views is that the life events only affect fairness views through social position, which is a strong assumption. Appendix Table A-14 shows that the pooled IV results that use all four shocks at once are close in magnitude to the baseline OLS estimates from Table 3. Using the individual shocks as instruments one by one yields broadly consistent effects as well. The exception is the hospitalization shock, which is at the same time very common and shifts income position only by a little (the "first stage" is weak).

not include the vote in the last general election (2015) in the benchmark table, as it is not measured in the pre-shock period and is, hence, a bad control. Since it can nevertheless serve as a proxy for past political views, we show the results controlling for party fixed effects in Table A-12.

Table 5: Correlation of life events with perceived unfairness, importance of effort and political views

	Current	Unfairness of inequality					Importance	Right-	N	Affected
	position	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing		%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Unemployment	-12.2***	0.20***	0.23***	0.21***	0.18***	0.20***	-0.11*	-0.061	7537	5.03
	(0.78)	(0.051)	(0.050)	(0.050)	(0.049)	(0.052)	(0.052)	(0.049)		
Disability	-21.9***	0.30*	0.54***	0.42**	0.27*		-0.31*	-0.25*	9246	0.61
	(2.31)	(0.13)	(0.13)	(0.13)	(0.13)		(0.13)	(0.13)		
Hospitalization	-1.83***	0.093**	0.079**	0.089**	0.060*	0.039	-0.010	-0.018	4749	55.5
	(0.49)	(0.029)	(0.028)	(0.028)	(0.028)	(0.028)	(0.029)	(0.028)		
Promotion	8.51***	-0.12**	-0.11**	-0.12**	-0.17***	-0.21***	0.14**	0.19***	7970	6.66
	(0.74)	(0.045)	(0.044)	(0.045)	(0.044)	(0.044)	(0.045)	(0.043)		
Pre-shock position FE	✓	✓	✓	✓	✓	✓	✓	✓		
Controls	✓	✓	✓	✓	✓	✓	✓	✓		

Notes: All outcomes z-scores. Each cell in the table is a separate regression of the column outcome on the row regressor and the controls indicated in the bottom part of the table. The explaining variables are all indicators that equal 1 if the respondent experienced the shock between 2012 and 2017. In each row, we exclude respondents who already experienced this type of shock in the pre-period (2008-2011). For *Unemployment*, we only use respondents who were in the workforce in the entire period. For *Disability*, we do not estimate the effect on fairness within sector, because very few disabled people work. *Controls* included in all regressions are a treatment indicator, cohort, gender, municipality, education and sector fixed effects (incl. unemployed/not in workforce), all measured in 2008. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

3.4 Survey Experimental Variation in Social Position: Correction of Misperceptions

In this section, we analyze the causal impact of changes in perceived position on fairness views. As described in Section 1.2, we informed a random half of the sample (the treatment group) about their true social positions in the five large reference groups before asking about their views on fairness, effort versus luck, and political attitudes.[19]

Table 6 shows the main experimental results. The outcome variables are the same as in Tables 3 to 5. The rows show the coefficients on an indicator variable for having a positive misperception of one's position within the given reference group (i.e., overestimating one's position), and on the interactions of treatment status with having a positive or a negative misperception for the reference group under consideration. In line with the correlations in Table 3, respondents with positive misperceptions of their position in any given reference group believe inequality to be less unfair, conditional on position fixed effects. When they are informed about their misperception, their views on inequality become more aligned with those of respondents at the same income position who do not overestimate their position. To see this, note that for all shocks the coefficient on the treatment indicator interacted with the indicator for having a positive misperception is of the opposite sign from the coefficient on the indicator for having a positive misperception (its magnitude ranges from being close to identical for the cohort group to three times smaller for the sector group). On the contrary, respondents who start with a negative misperception for a given reference group do not change their fairness views, even after they are informed that they are, in fact, ranked higher than they thought. The effect of correcting misperceptions is thus asymmetric, with "bad news" weighing more heavily than "good news" on respondents.

The last two columns show that the treatment has no significant effects on the role of effort versus luck and on political preferences. Similarly, we do not detect any significant effects on other views and attitudes (see Appendix Table A-18). Overall, these results suggest that changes in perceived social position have stronger effects on fairness than on other normative views, and that these effects are asymmetric.

Extensions. Since the treatment shows respondents their positions within all reference groups, the estimated treatment effect is the result of learning about all these positions at once. If a respondent overestimates their position in some groups, but underestimates it in others, the treatment may be pulling them in different directions at the same time. Therefore, Appendix Table A-15 restricts the sample to respondents who had either consistently positive misperceptions (i.e., overestimated their position in all reference groups) or consistently negative ones. The treatment effects for those with consistently positive misperceptions are larger and more significant, since the treatment corrected their misperceptions in the same direction for all reference groups.

[19] Due to the wish to treat all respondents fairly, the other half of the sample (the control group) was informed about their true positions only *after* these outcome questions, with no possibility to go back and change their answers. Hence, their answers to the outcome questions cannot be affected by this information.

Table 6: Survey information experiment and unfairness, importance of effort and political view

	Unfairness of inequality					Importance of effort	Right-wing
	Cohort	Gender	Mun.	Edu.	Sector		
Positive misperception	-0.132***	-0.131***	-0.133***	-0.108***	-0.267***	0.112**	0.117***
	(0.034)	(0.033)	(0.033)	(0.031)	(0.034)	(0.034)	(0.034)
T × Positive	0.154***	0.082*	0.099**	0.060*	0.089**	-0.010	-0.013
	(0.037)	(0.036)	(0.035)	(0.030)	(0.031)	(0.038)	(0.037)
T × Negative	0.023	0.022	0.028	0.044	0.005	0.006	-0.027
	(0.024)	(0.024)	(0.025)	(0.027)	(0.028)	(0.024)	(0.024)
N	9331	9331	9331	9331	8854	9331	9331
Position FE	✓	✓	✓	✓	✓	✓	✓

Notes: All outcomes are z-scores. *Positive misperception* is an indicator that equals 1 if the perceived position is larger than the actual position within the reported reference group specified in each column. For the *Importance of effort* and *Right-wing* outcomes, we use cohort misperception. *T* × *Positive* is an interaction of the treatment indicator and the *Postive misperception* indicator. *T* × *Negative* is an interaction of the treatment indicator and an indicator for having a misperception ≤ 0. In the regressions we also include a constant term. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Appendix Table A-16 studies different treatment "intensities" based on the magnitude of the individual's misperceptions pre-treatment. Treatment effects are stronger for respondents with larger positive misperceptions. There is again no effect on respondents who had large negative misperceptions. Appendix Table A-17 considers heterogeneous treatment effects by economic policy view. The treatment has the strongest effect on respondents with positive misperceptions who say that they have "moderate" economic policy view.

Robustness checks. The Appendix reports several robustness checks: The results are unaffected if we include controls (see Appendix Table A-19). The treatment information is based on people's reported income, not on their actual income, so one may potentially worry that the treatment effects could be affected by errors in people's reported income. However, this is not the case. As Appendix Table A-20 shows, restricting the sample to respondents who reported their own income accurately gives similar results. We also check that the heterogeneous treatment effect is indeed driven by the misperception, rather than by income per se. Appendix Table A-21 shows that the results are unchanged if we also include treatment-income interactions in the regressions. Finally, we adjust for multiple hypothesis testing in Appendix Table A-22.

4 Conclusion

Our results provide new answers to some of the long-standing questions asked in the Introduction. First, we find that people have some systematic misperceptions of varying magnitudes of their position in many reference groups. They exhibit a center bias whereby lower-ranked people tend to position themselves higher than they truly are because they think that others' incomes are lower.

The reverse holds for higher-ranked people. This center bias could be explained, for instance, by anchoring to one's own income or Bayesian shrinkage.

Second, we provide a number of results suggesting that people's fairness views are strongly related to their social position and change when their positions change. Fairness views correlate more strongly with current social positions than with past positions, and movements up or down in social positions caused by real-life events are also related to corresponding differences in people's fairness views. When informing people about their true positions in their reference groups, we observe changes in fairness views across all the reference groups, but with asymmetric effects: Those that are told that they are lower-ranked than they thought perceive inequality as more unfair. By contrast, those who are informed they are ranked higher than they thought do not change their views on fairness. Thus, when it comes to correcting misperceptions, bad news weigh more heavily than good news in people's minds.

Third, people consider inequalities conditional on the same level of education or work sector as most unfair. Exactly in these dimensions, where it matters most, people are least informed about inequality and lower-income people strongly overestimate their positions. It is an open question what drives this observed pattern, but it could have important implications for wage setting and career dynamics. One reason could be that people see education and type of work as choices of individuals that are key determinants of income. People from the same cohort, gender, or municipality can have very different education levels and types of work, and so it may be more expected that they earn different levels of income. To the contrary, inequality conditional on the key determinants of income (education and sector of work) may appear to be due to factors outside of people's control and, therefore, perceived as more unfair. Another reason could be that people have different aspirations across reference groups and that, hence, admitting that they have a low position within education group or sector could lead to more resentment. In any case, these different views on the fairness of inequality in various reference groups highlights the importance of decomposing changes in inequality into those happening within sectors or firms and those happening across, as done by, e.g., Card et al. (2013) and Song et al. (2019).

Are our results portable to other countries? Clearly, Denmark is one of the most equal countries in the world (Atkinson and Søgaard, 2016; Boserup et al., 2016; Jakobsen et al., 2020) and attitudes vary across countries (Alesina et al., 2001, 2018; Almås et al., 2020). Yet, because we analyze rank positions, relative inequality perceptions (e.g., differences between perceived and actual P95 levels compared to corresponding P50 levels) and relative fairness views across reference groups, it is not *a priori* clear that our results should be different in one direction or the other.

Key to our analysis and findings is the linking of large-scale survey data on perceived social positions and fairness to administrative records on actual social positions across time, life events and reference groups. We see this combination of subjective and objective information as a promising avenue to learn more about the determinants of perceptions and attitudes.

References

Alesina, A. and G.-M. Angeletos (2005). Fairness and redistribution. *American Economic Review 95*(4), 960–980.

Alesina, A., E. Glaeser, and B. Sacerdote (2001). Why Doesn't the United States Have a European-Style Welfare State? *Brookings Papers on Economic Activity 2001*(2), 187–277.

Alesina, A., S. Stantcheva, and E. Teso (2018). Intergenerational mobility and preferences for redistribution. *American Economic Review 108*(2), 521–54.

Almås, I., A. W. Cappelen, K. G. Salvanes, E. Ø. Sørensen, and B. Tungodden (2017). Fairness and family background. *Politics, Philosophy & Economics 16*(2), 117–131.

Almås, I., A. W. Cappelen, and B. Tungodden (2020). Cutthroat Capitalism versus Cuddly Socialism: Are Americans More Meritocratic and Efficiency-Seeking than Scandinavians? *Journal of Political Economy 128*(5), 1753–1788.

Andersen, A. G., S. Franklin, T. Getahun, A. Kotsadam, V. Somville, and E. Villanger (2020). Does Wealth Reduce Support for Redistribution? evidence from an Ethiopian Housing Lottery. Discussion Paper SAM 18/2020.

Andersen, H. Y. and S. Leth-Petersen (2020). Housing Wealth or Collateral: How Home Value Shocks Drive Home Equity Extraction and Spending. *Journal of the European Economic Association 0*(0), 1–38.

Anderson, M. L. (2008). Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects. *Journal of the American Statistical Association 103*(484), 1481–1495.

Atkinson, A. B. and J. E. Søgaard (2016). The Long-Run History of Income Inequality in Denmark. *The Scandinavian Journal of Economics 118*(2), 264–291.

Baker, M., Y. Halberstam, K. Kroft, A. Mas, and D. Messacar (2019). Pay transparency and the gender gap. NBER Working Paper 25834. *National Bureau of Economic Research*.

Bénabou, R. and E. A. Ok (2001). Social Mobility and the Demand for Redistribution: The Poum Hypothesis. *The Quarterly Journal of Economics 116*(2), 447–487.

Benjamini, Y., A. M. Krieger, and D. Yekutieli (2006). Adaptive linear step-up procedures that control the false discovery rate. *Biometrika 93*(3), 491–507.

Blanchflower, D. G. and A. J. Oswald (2004). Well-being Over Time in Britain and the USA. *Journal of Public Economics 88*(7-8), 1359–1386.

Boserup, S. H., W. Kopczuk, and C. T. Kreiner (2016, May). The Role of Bequests in Shaping Wealth Inequality: Evidence from Danish Wealth Records. *American Economic Review 106*(5), 656–61.

Boskin, M. J. and E. Sheshinski (1978). Optimal redistributive taxation when individual welfare depends upon relative income. *The Quarterly Journal of Economics 92*(4), 589–601.

Card, D., J. Heining, and P. Kline (2013). Workplace heterogeneity and the rise of West German wage inequality. *The Quarterly Journal of Economics 128*(3), 967–1015.

Card, D., A. Mas, E. Moretti, and E. Saez (2012). Inequality at work: The effect of peer salaries on job satisfaction. *American Economic Review 102*(6), 2981–3003.

Charité, J., R. Fisman, and I. Kuziemko (2015, March). Reference points and redistributive preferences: Experimental evidence. NBER Working Paper 21009. *National Bureau of Economic Research*.

Clark, A. E. and A. J. Oswald (1996). Satisfaction and comparison income. *Journal of Public Economics 61*(3), 359–381.

Cruces, G., R. Perez-Truglia, and M. Tetaz (2013). Biased perceptions of income distribution and preferences for redistribution: Evidence from a survey experiment. *Journal of Public Economics 98*, 100–112.

Cullen, Z. and R. Perez-Truglia (2018a). How Much Does Your Boss Make? the Effects of Salary Comparisons. NBER Working Paper 24841. *National Bureau of Economic Research*.

Cullen, Z. B. and R. Perez-Truglia (2018b). The salary taboo: Privacy norms and the diffusion of information. NBER Working Paper 25145. *National Bureau of Economic Research*.

Duesenberry, J. (1949). *Income, Saving, and the Theory of Consumer Behavior*. Economic Studies : No. 87. Harvard University Press.

Easterlin, R. A. (1974). Does economic growth improve the human lot? some empirical evidence. In P. A. David and M. W. Reder (Eds.), *Nations and Households in Economic Growth*, pp. 89–125. Academic Press.

Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization 27*(1), 35–47.

Easterlin, R. A. (2001). Income and happiness: Towards a unified theory. *The Economic Journal 111*(473), 465–484.

Easterlin, R. A., L. A. McVey, M. Switek, O. Sawangfa, and J. S. Zweig (2010). The happiness-income paradox revisited. *Proceedings of the National Academy of Sciences of the United States of America 107*(52), 22463–22468.

Epper, T., E. Fehr, H. Fehr-Duda, C. T. Kreiner, D. D. Lassen, S. Leth-Petersen, and G. N. Rasmussen (2020). Time discounting and wealth inequality. *American Economic Review 110*(4), 1177–1205.

Fehr, D., J. Mollerstrom, and R. Perez-Truglia (2019). Your place in the world: The demand for national and global redistribution. NBER Working Paper 26555. *National Bureau of Economic Research*.

Ferrer-i-Carbonell, A. (2005). Income and well-being: An empirical analysis of the comparison income effect. *Journal of Public Economics 89*(5-6), 997–1019.

Fisman, R., I. Kuziemko, and S. Vannutelli (2020). Distributional Preferences in Larger Groups: Keeping up with the Joneses and Keeping Track of the Tails. *Journal of the European Economic Association 0*(0), 1–32.

Giuliano, P. and A. Spilimbergo (2014). Growing up in a recession. *Review of Economic Studies 81*(2), 787–817.

Green-Pedersen, C. and K. Kosiara-Pedersen (2020). Det danske partisystem mellem kontinuitet og forandring. *Politica - Tidsskrift for politisk videnskab 52*(3), 215–233.

Hoy, C. and F. Mager (Forthcoming). Why Are Relatively Poor People Not More Supportive of Redistribution? evidence from a Randomized Survey Experiment across 10 Countries. *American Economic Journal: Economic Policy*.

Jakobsen, K., K. Jakobsen, H. Kleven, and G. Zucman (2020). Wealth taxation and wealth accumulation: Theory and evidence from Denmark. *The Quarterly Journal of Economics 135*(1), 329–388.

Karadja, M., J. Mollerstrom, and D. Seim (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.

Kleven, H. J., M. B. Knudsen, C. T. Kreiner, S. Pedersen, and E. Saez (2011). Unwilling or unable to cheat? evidence from a tax audit experiment in Denmark. *Econometrica 79*(3), 651–692.

Kreiner, C. T., D. D. Lassen, and S. Leth-Petersen (2019). Liquidity constraint tightness and consumer responses to fiscal stimulus policy. *American Economic Journal: Economic Policy 11*(1), 351–379.

Kuziemko, I., R. W. Buell, T. Reich, and M. I. Norton (2014). 'Last-place aversion': Evidence and redistributive implications. *The Quarterly Journal of Economics 129*(1), 105–149.

Kuziemko, I., M. I. Norton, E. Saez, and S. Stantcheva (2015). How elastic are preferences for redistribution? evidence from randomized survey experiments. *American Economic Review 105*(4), 1478–1508.

Londoño-Vélez, J. (2021). The Impact of Diversity on Distributive Perceptions and Preferences for Redistribution.

Luttmer, E. F. P. (2005). Neighbors as Negatives: Relative Earnings and Well-Being. *The Quarterly Journal of Economics 120*(3), 963–1002.

Malmendier, U. and S. Nagel (2011, February). Depression Babies: Do Macroeconomic Experiences Affect Risk Taking? *The Quarterly Journal of Economics 126*(1), 373–416.

Meltzer, A. H. and S. F. Richard (1981). A rational theory of the size of government. *Journal of Political Economy 89*(5), 914–927.

Roth, C. and J. Wohlfart (2018). Experienced inequality and preferences for redistribution. *Journal of Public Economics 167*, 251–262.

Song, J., D. J. Price, F. Guvenen, N. Bloom, and T. Von Wachter (2019). Firming up inequality. *The Quarterly Journal of Economics 134*(1), 1–50.

Weinzierl, M. (2014). The promise of positive optimal taxation: Normative diversity and a role for equal sacrifice. *Journal of Public Economics 118*, 128–142.

APPENDIX

Contents

A Survey

A.1 Survey link and questions in English

Link: https://cebi.eu.qualtrics.com/jfe/form/SV_6PcXP1t0Mw89iqp

Background and Political views

1. What is your birth year?
   Dropdown menu with years. Only 1969-1973 accepted.

2. What is your gender?
   Male; Female

3. How many siblings do you have with the same biological mother and father as you?
   0; 1; 2 or more

4. Which municipality did you live in at the beginning of 2017? Note that in the following options, some of the municipalities are grouped together.
   Dropdown menu with Danish municipalities

5. Which of the following categories best describes your highest educational level?
   Primary education; Upper secondary education; Vocational education and training; Short cycle higher education; Bachelor program or vocational bachelor education; Master program or PhD program

6. What was your employment status at the beginning of 2017?
   Full-time employment; Part-time employment; Self-employed; Unemployed; Not in the workforce

7. Which sector did you work in at the beginning of 2017? Note that we mean the sector which your workplace belongs to. For example, if you work with PR in a bank you should choose the sector "Finance and insurance" and not the sector "Information and communication".
   Construction; Real estate activities; Business services; Finance and insurance; Trade and transport; Manufacturing, raw material extraction and utilities; Information and communication; Culture, leisure and other services; Agriculture, forestry and fishing; Public administration, education, health and social work activities

8. Which party did you vote for in the last general election (in 2015)?
   Socialdemokratiet; Venstre, Danmarks Liberale Parti; Radikale Venstre; Enhedslisten - De Rød-Grønne; Det Konservative Folkeparti; Alternativet; SF - Socialistisk Folkeparti; Liberal Alliance; Kristendemokraterne; Dansk Folkeparti; Other; Did not vote; Do not wish to answer

9. How would you describe your attitude on economic policy?
   Very left-wing; Left-wing; Moderate; Right-wing; Very right-wing

Income

1. We will now ask you about your total income BEFORE tax in 2017. You should NOT include contributions to employer-managed pension schemes or mandatory pension contributions. When we later will inform you about your own position, it is important that you state your total income as precisely as possible. If you are in doubt about the amounts, you can view them on your annual statement for 2017 from SKAT under *Opgørelse af indkomst* below *Før AM-bidrag*. You can also see a description of the different categories below. Note: In the scheme below we ask you to please state the yearly amounts in entire thousand DKK. If you enter 1 this corresponds to 1,000 DKK.
   Salary and fees; Net profit from self-employment; Unemployment benefits, social assistance, study grants and pension payments

Perceptions

1. Instruction video

2. We will now ask you a question to see if you have understood the video's explanation of the ladder's different positions. Think about a person with an income where 73 out of 100 people have an income that is the same as or lower than this person's income. 27 out of 100 people have an income which is higher than this person's income. Select this person's position on the income ladder using the slider below.

3. What do you think the income for P50 was in 2017 for individuals born in [PIPED BIRTH YEAR]? Remember that P50 is the income, where half have an income that is the same as or lower than this income, and half have an income that is higher than this income. Remember also that income is before tax for the whole of 2017 and consists of salary, net profit from self-employment, other business income, unemployment benefits, transfers and payments from private and public pensions. Note: Please state your answer in entire thousand DKK. If you enter 1 it corresponds to 1,000 DKK

4. We will now ask you what you think the before tax income for P50 was in 2017 for the groups below which you are a part of. The first slider shows your answer from the previous question. You can use the other sliders to select what you think the income was for P50 for the different groups of people who were born the same year as you.
   One horizontal slider for each reference group. The slider for cohort is locked at the amount entered in the previous question.

5. What do you think the income for P95 was in 2017 for individuals born in [PIPED BIRTH YEAR]? Remember that P95 is the income where 95 out of 100 have an income that is the same as or lower than this income, and 5 out of 100 have an income that is higher than this

income. Please state your answer in entire thousand DKK. If you enter 1 it corresponds to 1,000 DKK

6. We will now ask you what you think the before tax income for P95 was in 2017 for the groups below which you are a part of. The first slider shows your answer from the previous question. You can use the other sliders to select what you think the income was for P95 for the different groups of people who were born the same year as you.
   One horizontal slider for each reference group. The slider for cohort is locked at the amount entered in the previous question.

7. Rank among all people born in [PIPED BIRTH YEAR]. You previously reported that you had a yearly income in 2017 of [PIPED INCOME] DKK before tax. We will now ask you to report where you think this income placed you on the income ladder in 2017 for people who were born in [PIPED BIRTH YEAR]. Use the slider to select your position. Later, we will inform you about your true position.

8. Rank among [PIPED GENDER]. Now, think about all [PIPED GENDER] born in [PIPED BIRTH YEAR]. Use the slider to select where you think you were placed on the income ladder in 2017 for this group of people. Later, we will inform you about your true position.

9. Rank within [PIPED MUNICIPALITY] municipality. Now, think about people who also lived in [PIPED MUNICIPALITY] municipality at the beginning of 2017 and were born in [PIPED BIRTH YEAR]. Use the slider to select where you think you were placed on the income ladder in 2017 for this group of people. Later, we will inform you about your true position.

10. Rank within the educational level [PIPED EDUCATION]. Now, think about people whose educational level also was [PIPED EDUCATION] at the beginning of 2017 and were born in [PIPED BIRTH YEAR]. Use the slider to select where you think you were placed on the income ladder in 2017 for this group of people. Later, we will inform you about your true position.

11. Rank within the sector [PIPED SECTOR]. Now, think about people who also worked in the sector [PIPED SECTOR] at the beginning of 2017 and were born in [PIPED BIRTH YEAR]. Use the slider to select where you think you were placed on the income ladder in 2017 for this group of people. Later, we will inform you about your true position.

12. Think about your [FOR WOMEN: mother's. FOR MEN: father's] total income in the year where you turned 15. Compared to [FOR WOMEN: mothers. FOR MEN: fathers] of children, who were also born in [PIPED BIRTH YEAR], where do you think your [FOR WOMEN: mother. FOR MEN: father] was placed on the income ladder in the year where you turned 15?

13. Is your income higher or lower than [FOR REPONDENTS WITH ONE SIBLING: your brother's/sister's income? FOR RESPONDENTS WITH 2 OR MORE SIBLINGS: the average income of your siblings?]
    Higher; The same; Lower

14. Think about your co-workers at the beginning of 2017. By co-workers, we mean the people who had the same workplace as you at the beginning of 2017. A workplace usually has the same address so if you for instance worked in a chain store then your co-workers are those who worked in the same store as you and not all the people, who were employed in the same firm. How many people worked at your workplace at the beginning of 2017 incl. you? If you do not remember the exact number then report your best guess.

15. Imagine that we rank you and your colleagues by your income in 2017 such that the person with the lowest income is number 1 and the person with the highest income is number [PIPED # COWORKERS]. What do you think your position was in this rank in 2017?

16. Think about your neighbors at the beginning of 2017. By neighbors, we mean the people who lived on the same road as you, if you lived in a house, or the people living on the same stairwell as you, if you lived in an apartment. Think only about the people, who were between 25 and 65 years old. How many people lived on the same road or on the same stairwell as you, including your own household, at the beginning of 2017? If you do not remember the exact number then report your best guess.

17. Imagine that we rank you and your neighbors by your income in 2017 such that the person with the lowest income is number 1 and the person with the highest income is number [PIPED # NEIGHBORS]. What do you think your position was in this rank in 2017?

18. Think about your schoolmates when you were 15 years old. By schoolmates, we mean everybody at your school who was born in [PIPED BIRTH YEAR], and not just the people in your class. How many schoolmates were you including yourself? If you do not remember the exact number then report your best guess.

19. Imagine that we rank you and your schoolmates by your income in 2017, such that the person with the lowest income is number 1 and the person with the highest income is number [PIPED # SCHOOLMATES]. What do you think your position was in this rank in 2017?

Treatment

For the treatment group this block appears here. For the control group it appears after the block "Outcomes".

For each reference group, cohort/gender/municipality/educational level/sector, we provide the following information on separate pages along with a visualization of the difference:

You GUESSED that you were on position PXX.
Based on the income you reported, your TRUE position is PXX.
You are actually X positions higher/lower on the ladder than you thought.

Outcomes

1. On a scale from 1 to 7 where 1 is "Completely fair", 4 is "Neither fair nor unfair" and 7 is "Completely unfair", indicate to what extent you think that it is fair or unfair that there are differences in income among people born the same year as you WITHIN the following groups that you are yourself a part of?

   (a) Differences in income among people born in [PIPED BIRTH YEAR]

   (b) Differences in income among [PIPED GENDER] born in [PIPED BIRTH YEAR]

   (c) Differences in income among people living in [PIPED MUNICIPALITY] municipality

   (d) Differences in income among people with the educational level [PIPED EDUCATION]

   (e) Differences in income among people working in the sector [PIPED SECTOR]

2. Now, think about people born the same year as you WITHIN these groups (indicated below). On a scale from 1 to 7 where 1 is "Only luck", 4 is "Equally important", and 7 is "Only effort", indicate to what extent you think that differences in income are caused by differences in peoples' efforts over their lifetime or rather by luck? By luck, we mean conditions, which you have no control over. By effort, we mean conditions, which you can control.

   (a) Reason for different incomes among people born in [PIPED BIRTH YEAR]?

   (b) Reason for different incomes among [PIPED GENDER] born in [PIPED BIRTH YEAR]?

   (c) Reason for different incomes among people living in [PIPED MUNICIPALITY] municipality?

   (d) Reason for different incomes among people with the educational level [PIPED EDUCATION]?

   (e) Reason for different incomes among people working in the sector [PIPED SECTOR]?

3. Which party would you vote for if there was a general election today?
   Socialdemokratiet; Venstre, Danmarks Liberale Parti; Radikale Venstre; Enhedslisten - De Rød-Grønne; Det Konservative Folkeparti; Alternativet; SF - Socialistisk Folkeparti; Liberal Alliance; Kristendemokraterne; Dansk Folkeparti; Nye Borgerlige; Other; Do not wish to answer

4. Below, you see six statements which you can agree or disagree with. On a scale from 1 to 7 where 1 is "Completely agree", 4 is "Neither agree nor disagree", and 7 is "Completely disagree", indicate to what extent you agree or disagree with each statement.

(a) Income inequality is a problem in Denmark

(b) The government should increase redistribution of income by increasing taxes and transfers to reduce inequality

(c) I am generally satisfied with my life

(d) My work has generally paid off

(e) People with high incomes have worked hard for their income and deserve it

(f) If a person is poor this is mainly due to lack of effort from his or her side

Outro

1. It is important for our study that we only use responses from people, who have given the survey their full attention. You will automatically participate in the lottery no matter what you answer, but we would like to know how much attention you have given the survey.
   1 I barely gave the survey any attention; ... ; 7 I gave the survey my full attention

2. Do you think that the survey was biased?
   Yes, it was right-winged; Yes, it was left-winged; No, it was neutral

3. If you have any comments about the survey, then you are welcome to write them here:

A.2 Instruction video link and script

Link: https://www.dropbox.com/s/ya1z0nlmii5tkpo/Instruktionsvideo.m4v?dl=0

We will now ask you some questions regarding the distribution of income between Danes born the same year as you.

It may be difficult to answer, but we ask you to try your best.

There are differences between peoples' incomes. Some people have a high income, others have a low income.

The ladder to the left illustrates **how the incomes are distributed between Danes** born the same year as you.

This is also called the income distribution.

Think of 100 people born the same year as you.

They are ranked according to their income such that the person with the lowest income is at the bottom of the ladder and the person with the highest income is at the top of the ladder.

Look at the person next to the first rung of the ladder.

5 out of 100 people (i.e. 5 %) have an income which is the same as or **lower** than the income of this person.

We call this P5, because the person has position 5 on the income ladder.

The person on the middle rung has position 50.

Exactly half of all people (i.e. 50 %) born the same year as you have an income which is the same as or **lower** than the income of this person and **exactly half** have an income which is **higher** than the income of this person.

We call the position in the middle for P50.

Remember that P50 is the position in the middle since we will use this several times in the following questions.

The person next to the top rung has position 95.

95 out of 100 (i.e. 95 %) have an income which is the same as or **lower** than the income of this person and only 5 out of 100 people born the same year as you (i.e. 5 %) have an income which is higher than the income of this person.

Remember what P95 indicates since we are going to use this several times.

Shortly, we will now ask you what you think the income is for P50 and P95, respectively, for Danes born the same year as you

Next, we will ask you what you think **your position** is on the ladder.

You are welcome to watch the video again if you are not sure of the meaning of the different positions.

A.3 Survey screenshots

FIGURE A-1: INCOME QUESTION

We will now ask you about your **total income BEFORE tax in 2017**. You should **NOT** include contributions to employer-managed pension schemes or mandatory pension contributions. When we later will inform you about your own position, it is important that you state your total income as precisely as possible. If you are in doubt about the amounts, you can view them on your annual statement for 2017 from SKAT under *Opgørelse af indkomst* below **Før AM-bidrag**. You can also see a description of the different categories below.

Note: In the scheme below we ask you to please state the **yearly** amounts in **entire thousand DKK**. If you enter 1 this corresponds to 1,000 DKK.

Salary and fees		thousand DKK
Net profit from self-employment		thousand DKK
Unemployment benefits, social assistance, study grants and pension payments		thousand DKK
Total	0	thousand DKK

Examples

Salary and fees: Taxable wage income before tax and before labor market contribution and fees. You should include:

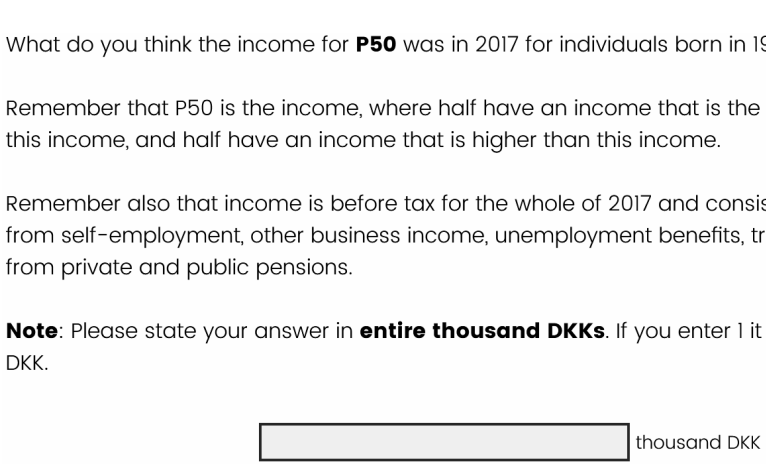
- Value of fringe benefits
- Taxable foreign wage
- Wage during sickness and maternity/paternity leave
- Fees from board duties, consultancy work, talks etc.
- Value of stock options, severance pay and anniversary bonus

On your tax statement this corresponds to box 11 + 12 + 14.

Net profit from self-employment: Net profit from self-employment after capital income and expenses. On your tax statement this corresponds to box 111 minus box 112.

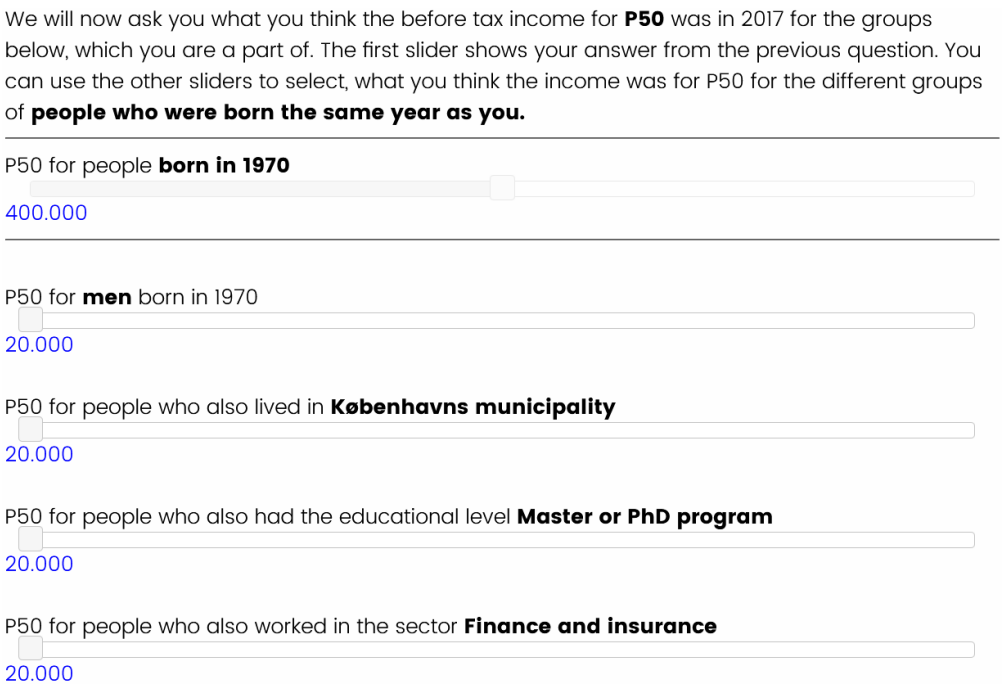
Unemployment benefits, social assistance, study grants and pension payments: Unemployment benefits, cash benefits, sickness benefits, maternity/paternity benefits, study grants, payments from private pensions, public pensions and disability pensions. On your tax statement this corresponds to box 16.

Figure A-2: Elicitation of cohort P50 perception



Notes: The figure shows a screenshot from the survey for a person who reported being born in 1971.

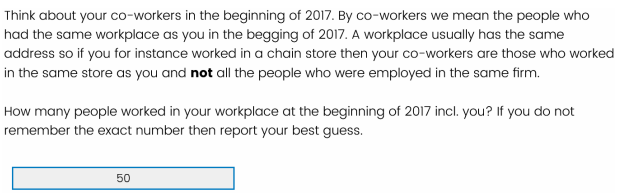
Figure A-3: Elicitation of large reference group P50 perceptions



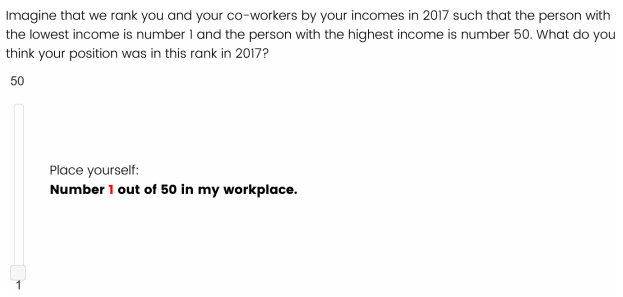
Notes: The top slider shows the piped answer to the question in figure A-2 and cannot be moved. The sliders go from 20,000 to 8,069,000 in 200 steps according to $Y = 20000 * EXP(0.03 * Step)$. In the middle position the slider has the value 402,000.

FIGURE A-4: ELICITATION OF NUMBER OF CO-WORKERS AND POSITION AMONG CO-WORKERS

(A) NUMBER



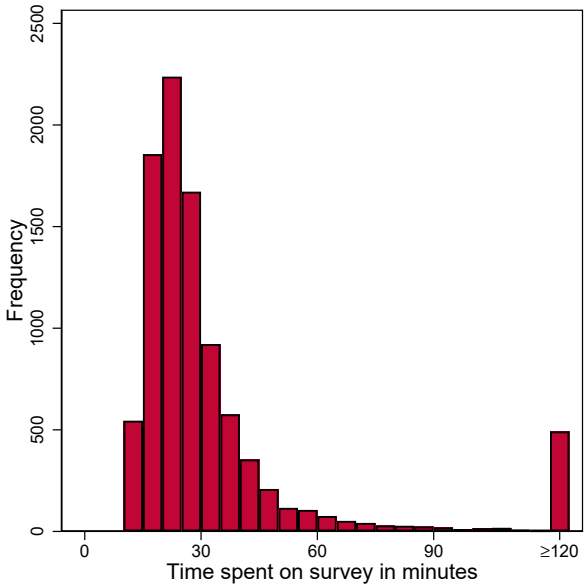
(B) POSITION



Notes: The panels show screenshots from two pages in the survey. On the first page in this example, the respondent reports having 50 co-workers (the box is empty as default). On the second page, this number is piped as the max of the slider, and when the respondent moves the slider with the cursor the red position number changes accordingly.

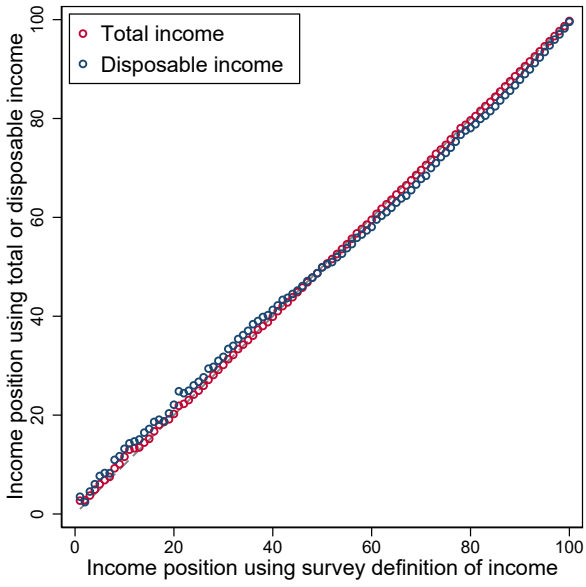
B Data Collection, Survey Design and Administrative Data

FIGURE A-5: FULL DISTRIBUTION OF TIME SPENT ON ANSWERING THE SURVEY



Notes: The figure shows the distribution of time spent on the survey for the analysis sample. The bin width is 5 minutes and the distribution is censored above 120 minutes.

FIGURE A-6: COMPARISON OF POSITION USING DIFFERENT INCOME DEFINITIONS



Notes: The figure uses all individuals born from 1969 to 1973 observed in the income register data. N=389,759. We use total income and disposable income as defined by Statistics Denmark.

Table A-1: Attrition analysis

	Not in sample	
Panel A		
Treatment	0.011	(0.008)
Male	-0.083***	(0.008)
Age	0.001	(0.003)
Married	-0.021**	(0.008)
Ref.: Middle 40%		
Bottom 50 %	0.149***	(0.009)
Top 10 %	-0.060***	(0.012)
Ref.: Master programs		
Primary education	0.157***	(0.017)
Upper secondary edu.	0.017	(0.019)
Vocational education	0.086***	(0.012)
Short cycle higher edu.	0.014	(0.017)
Bachelor programs	0.026*	(0.012)
Ref.: Nothern Jutland		
Copenhagen	0.016	(0.015)
Sealand	-0.000	(0.016)
Southern Denmark	0.007	(0.015)
Middle Jutland	-0.014	(0.015)
Observations	13667	
Panel B		Share
Not in the final sample		0.312
Drop out at consent question		0.010
Drop out at income question		0.102
Drop out before treatment		0.242
Drop out after treatment		0.012
Screened out		0.049

Notes: Respondents who dropped out before the treatment, were not assigned to either the treatment or control group. We randomly assign these individuals to one of the groups. The number of observations in the regression in Panel A is 19 lower than total number of people who started the survey. This is because we miss educational information for these individuals. The sum of *Drop out before treatment*, *Drop out after treatment* and *Screened out* sum to 30.3%. The last 0.9% are people who are assigned to the control but do not complete the survey. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-2: Treatment balancing

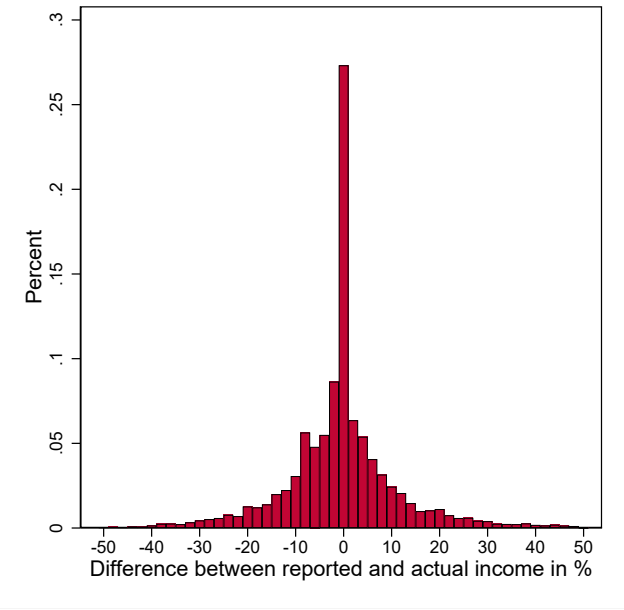
	Control	Treatment	Difference	
Actual cohort position	64.003	64.370	-0.367	(0.513)
Treatment information	-5.812	-6.048	0.237	(0.335)
Cohort misperception	-5.767	-6.064	0.297	(0.353)
Left-wing	0.219	0.222	-0.003	(0.009)
Right-wing	0.236	0.241	-0.004	(0.009)
Male	0.511	0.518	-0.007	(0.010)
Age	47.058	46.998	0.060*	(0.029)
Primary education	0.077	0.075	0.001	(0.005)
Upper secondary education	0.061	0.054	0.007	(0.005)
Vocational education	0.317	0.312	0.005	(0.010)
Short cycle higher education	0.090	0.091	-0.001	(0.006)
Bachelor programs	0.264	0.274	-0.010	(0.009)
Master programs	0.190	0.193	-0.003	(0.008)
Self-employed	0.038	0.036	0.003	(0.004)
Employee	0.902	0.904	-0.001	(0.006)
Unemployed	0.011	0.013	-0.001	(0.002)
Private sector	0.660	0.657	0.003	(0.010)
Not in work force	0.048	0.048	-0.000	(0.004)
Copenhagen	0.087	0.086	0.001	(0.006)
Sealand	0.237	0.229	0.008	(0.009)
Southern Denmark	0.199	0.215	-0.016	(0.008)
Middle Jutland	0.312	0.308	0.004	(0.010)
Nothern Jutland	0.164	0.161	0.003	(0.008)
N			9415	

Notes: Column 1 and 2 show the group means of the variables. Column 3 shows the difference. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-3: Match between survey response and register data

	N	Share
Correct cohort	9,415	1.00
Correct gender	9,415	1.00
Correct municipality	9,239	0.98
Correct level of education	6,958	0.74
Correct sector	6,768	0.72
All correct	4,952	0.53

Figure A-7: Relative difference between reported and actual income

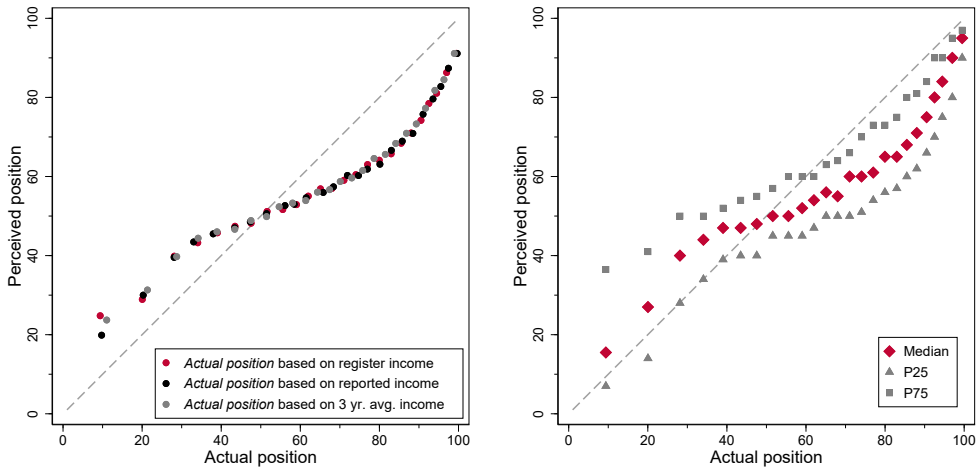


Notes: The panel shows a histogram of the relative difference between reported and actual income in %. The bin width is 2 and the plot is truncated at ±50. We see a small spike at a reported income 8-9% below actual income. Respondents are asked to report their income including labor-market contribution, which is 8% of income before taxes; a few respondents seem to report their income excluding these contributions. The spike at zero suggests that some of the respondents have checked their actual income on the tax return when answering the survey.

C Perceptions and Misperceptions about Social Positions

FIGURE A-8: PERCEIVED POSITION WITHIN COHORT

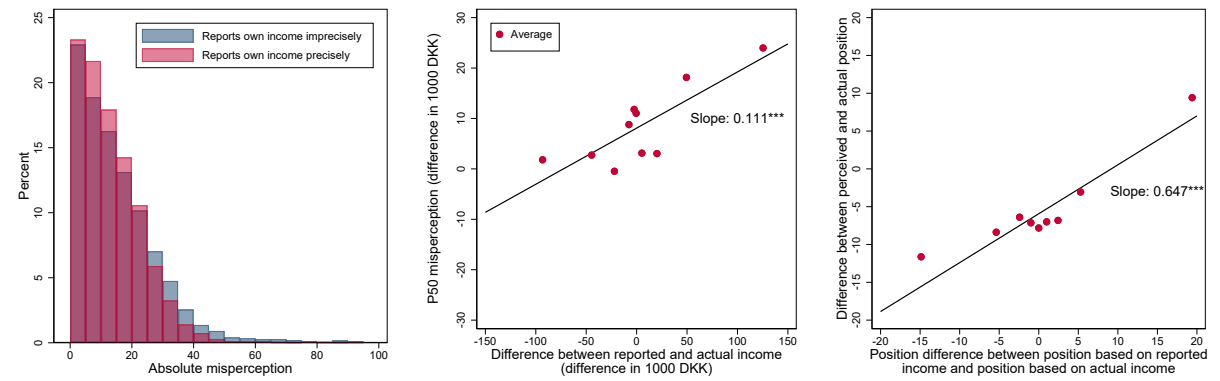
(A) ACTUAL INCOME MEASURES (B) MOMENTS



Notes: The left panel is a bin scatter of the average perceived position by actual position (in 25 equally-sized bins). Actual position is either based on the actual income observed on the tax return, the income reported in the survey, or a three-year average of actual income. The right panel shows the 25th, 50th and 75th percentile of perceived position by bins of actual income position.

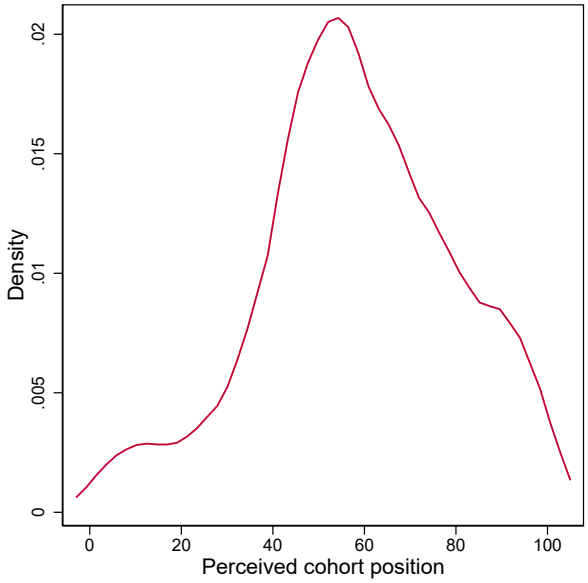
FIGURE A-9: MISPERCEPTION OF OWN INCOME AND OWN POSITION

(A) DISTRIBUTION (B) 50 MISPERCEPTION (C) OWN POSITION



Notes: Panel A shows the distribution of absolute misperceptions. We split the sample into people whose perceived income is within a 5% error band of the actual income, *Reports own income precisely*, and those whose perceived income is more than 5% above or below the actual income, *Reports own income imprecisely*. Panel B shows a binned scatter of the average misperception in P50 by difference between reported and actual income. The line illustrates the predicted relationship from an OLS regression. Panel C shows a binned scatter of the average misperception of cohort position by the difference between actual position based on reported income and actual position based on actual income. The line illustrates the predicted relationship from an OLS regression.

Figure A-10: Distribution of perceived cohort position



Notes: The panel shows a density plot and is constructed using Epanechnikov kernels with a bandwidth of 5.

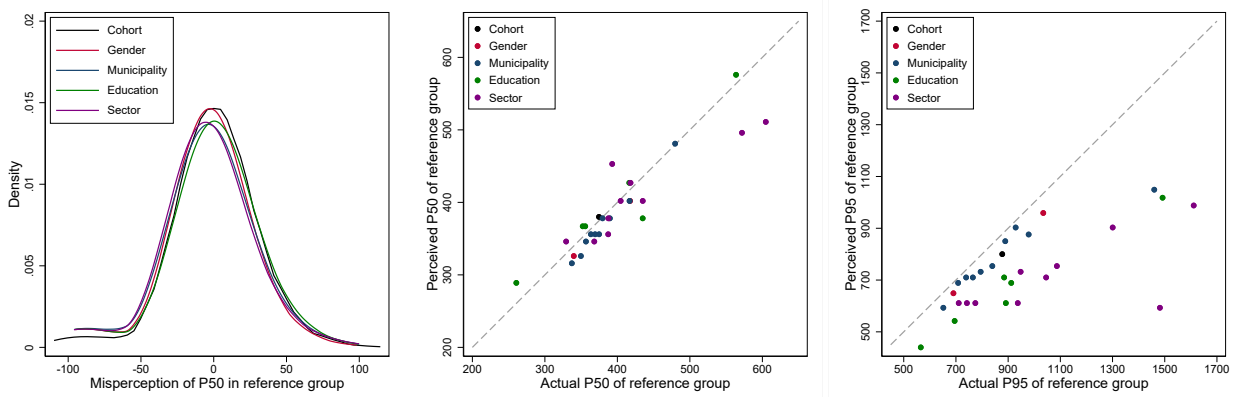
TABLE A-4: ACCURACY OF PERCEPTIONS REGRESSED ON INDIVIDUAL CHARACTERISTICS

	A. Top 20% most inaccurate			B. Top 20% most accurate		
	Position	P50	P95	Position	P50	P95
Male	-0.04***	-0.06***	-0.04***	0.04***	0.02*	0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Left-wing	-0.02*	0.00	0.03**	0.01	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Right-wing	-0.03**	-0.01	-0.00	0.03**	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Middle Jutland	-0.02	0.01	0.03	-0.01	0.00	0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Southern Denmark	-0.03	0.01	0.03	0.00	-0.01	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Sealand	-0.01	0.04**	0.02	0.01	-0.00	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Copenhagen Area	-0.02	0.02	0.01	-0.01	-0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Vocational education	-0.06**	-0.04	-0.00	0.01	-0.00	0.04
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Upper secondary edu.	-0.03*	-0.03*	-0.02	0.01	0.03	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Short cycle higher edu.	-0.05**	-0.07***	-0.04	0.02	0.02	0.06**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Bachelor programs	-0.08***	-0.06**	-0.02	0.04*	0.02	0.04*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Masters programs and PhD	-0.15***	-0.11***	-0.01	0.10***	0.05**	0.06**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Construction	0.03	-0.01	-0.01	0.00	-0.04	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Real estate activities	0.04	-0.03	-0.07	-0.00	-0.06	0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Business service	0.06*	0.01	-0.01	-0.04	-0.02	0.01
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Finance and insurance	-0.01	-0.02	-0.06*	0.05	-0.05	0.04
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Trande and transport	0.06*	0.01	-0.02	-0.02	-0.03	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Manufacturing	0.04	0.00	-0.03	-0.02	-0.03	0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Information and communication	-0.02	-0.02	-0.03	0.00	-0.02	0.00
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Culture and leisure	0.01	-0.03	-0.04	0.07*	0.02	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Agriculture	0.08	-0.10*	-0.06	-0.04	0.04	0.07
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Public adm., edu. and health	0.03	-0.02	-0.03	-0.01	-0.01	0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
N	9415	9415	9415	9415	9415	9415
R^2	0.087	0.034	0.025	0.079	0.036	0.029
Cohort FE	✓	✓	✓	✓	✓	✓
Actual position FE	✓	✓	✓	✓	✓	✓

Notes: In Panel A (respectively, Panel B), the outcomes are indicator variables equal to 1 if the respondent is among the 20% of respondents with the largest (respectively, smallest) misperceptions for each variable. The 20% most inaccurate respondents misperceive their position by more than 22 percentiles, the P50 by more than 33%, and P95 by more than 66%. The 20% most accurate ones misperceive their position by less than 5 percentiles, the P50 by less than 6%, and P95 by less than 10%. The *Actual position FE* is fixed effects for all 100 positions in the income distribution. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

FIGURE A-11: DISTRIBUTION OF P50 MISPERCEPTIONS AND MEDIAN PERCEIVED P50 AND P95 INCOMES FOR LARGE REFERENCE GROUPS

DISTRIBUTION P50 P95

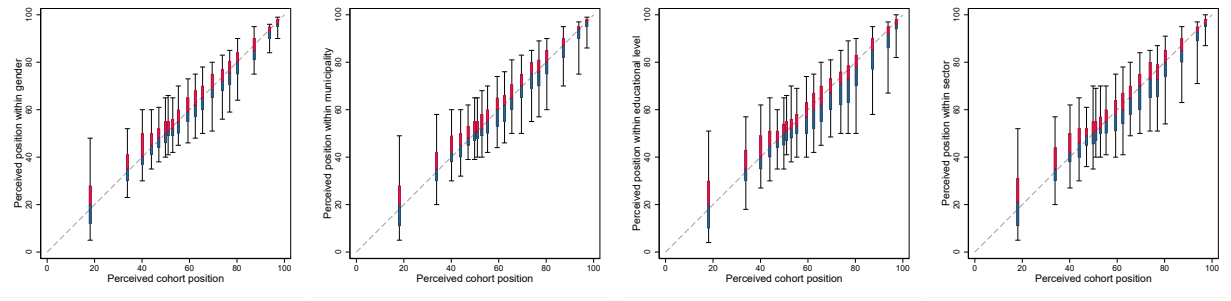


Notes: In the left panel, we show the distributions of P50 misperceptions in the large reference groups. The distributions are smoothed using epanechnikov kernels with a bandwidth of 15. In the middle and right panels, we show bin medians instead of bin means using the same sample as in figure 5. For gender, we show one scatter for men and one for women. For municipality we divide the respondents into 10 similar sized groups based on the actual municipality P50 and P95 income and plot one scatter for each group. For education and sector we show one scatter for each educational level or sector.

FIGURE A-12: VARIATION IN PERCEIVED POSITION AND MISPERCEPTION ACROSS LARGE REFERENCE GROUPS

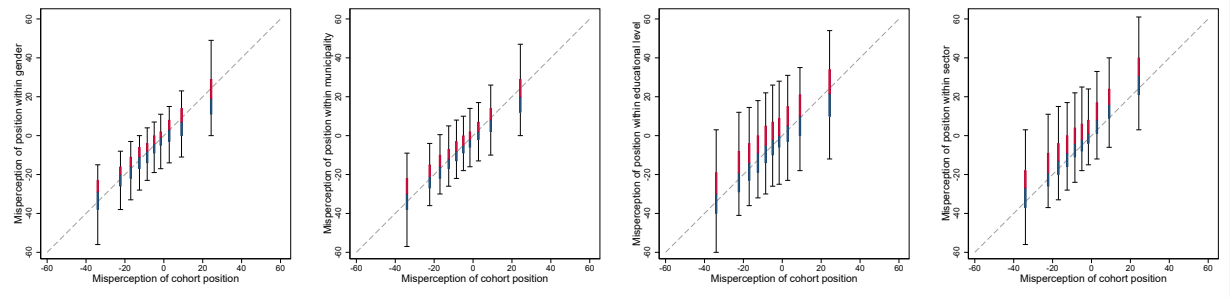
PERCEIVED POSITION

(A) GENDER (B) MUNICIPALITY (C) EDUCATION (D) SECTOR



MISPERCEPTION

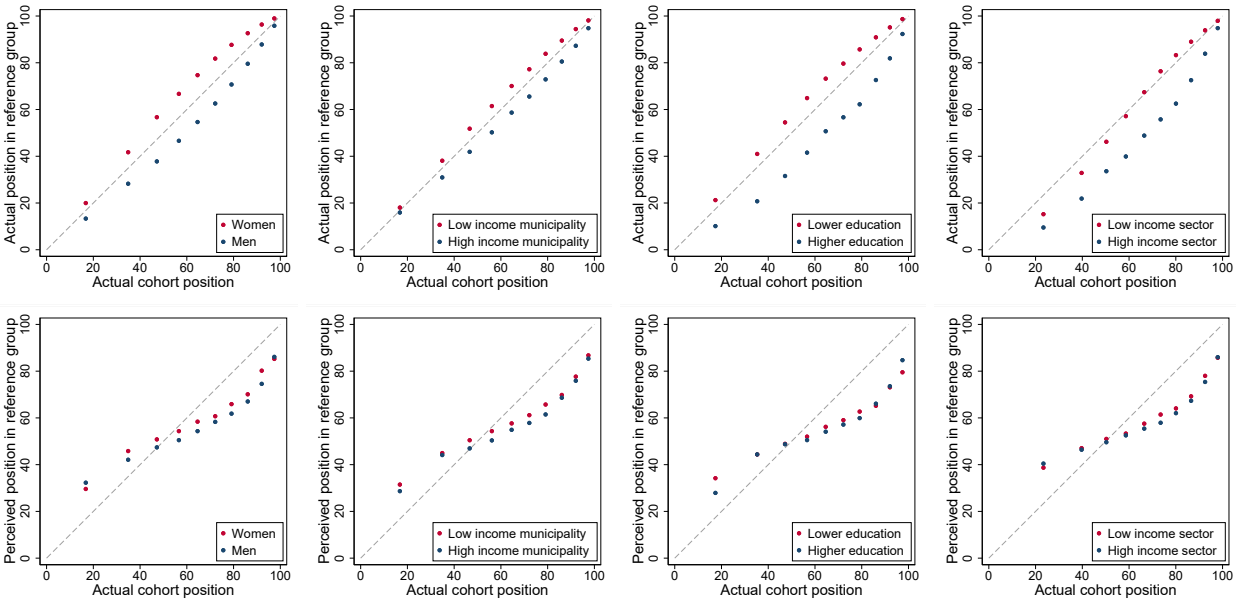
(E) GENDER (F) MUNICIPALITY (G) EDUCATION (H) SECTOR



Notes: This figure shows 5th, 25th, 50th, 75th and 95th percentile of reported position within the large reference group by bins of perceived cohort position in the top row and misperception of own position within the large reference group by bins of misperception of cohort position in the bottom row.

FIGURE A-13: CORRELATION BETWEEN ACTUAL COHORT POSITION AND ACTUAL VERSUS PERCEIVED POSITION WITHIN REFERENCE GROUPS

(A) GENDER (B) MUNICIPALITY (C) EDUCATION (D) SECTOR

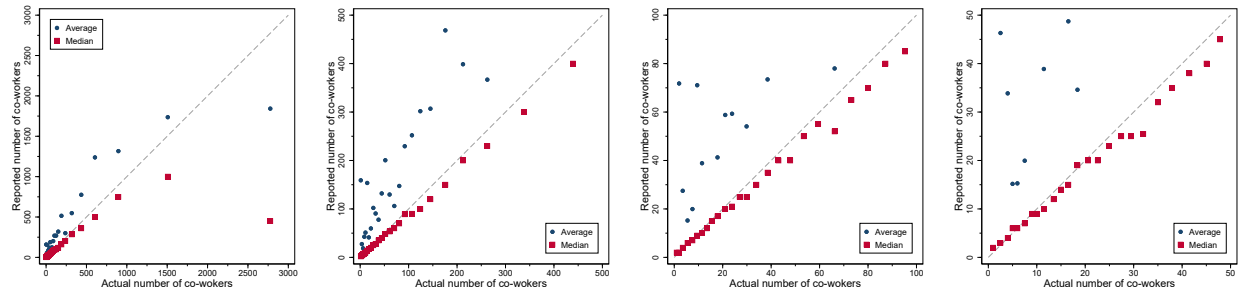


Notes: The top panels plot *actual* reference group positions by actual cohort positions, while the bottom panels plot *perceived* reference group positions by actual cohort positions. The high/low income split for municipality is based on the median of within cohort in sample actual municipality P50 income. This is also the case for sector. For education, *Higher education* is short cycle higher education, bachelor programs and master programs.

FIGURE A-14: ACTUAL AND REPORTED NUMBER OF PEOPLE IN SMALL REFERENCE GROUPS

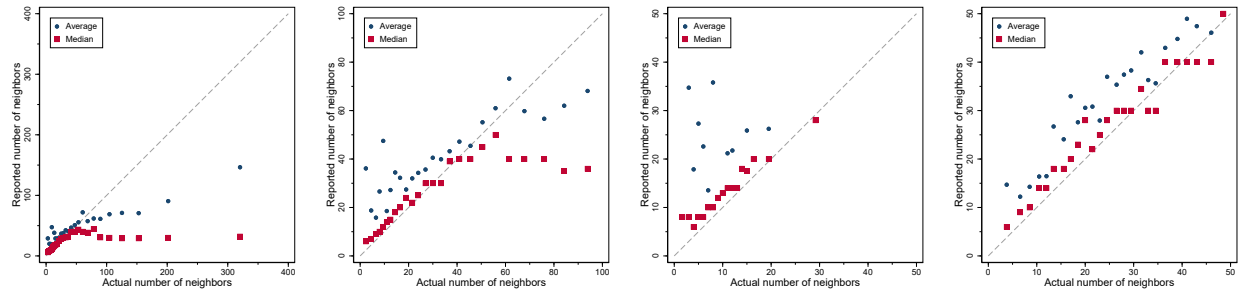
(A) CO-CORKERS

< 4000 < 500 < 100 < 50

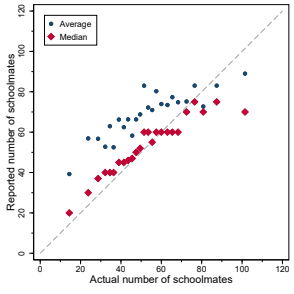


(B) NEIGHBORS

< 500 < 100 < 50 (APARTMENTS) < 50 (HOUSES)



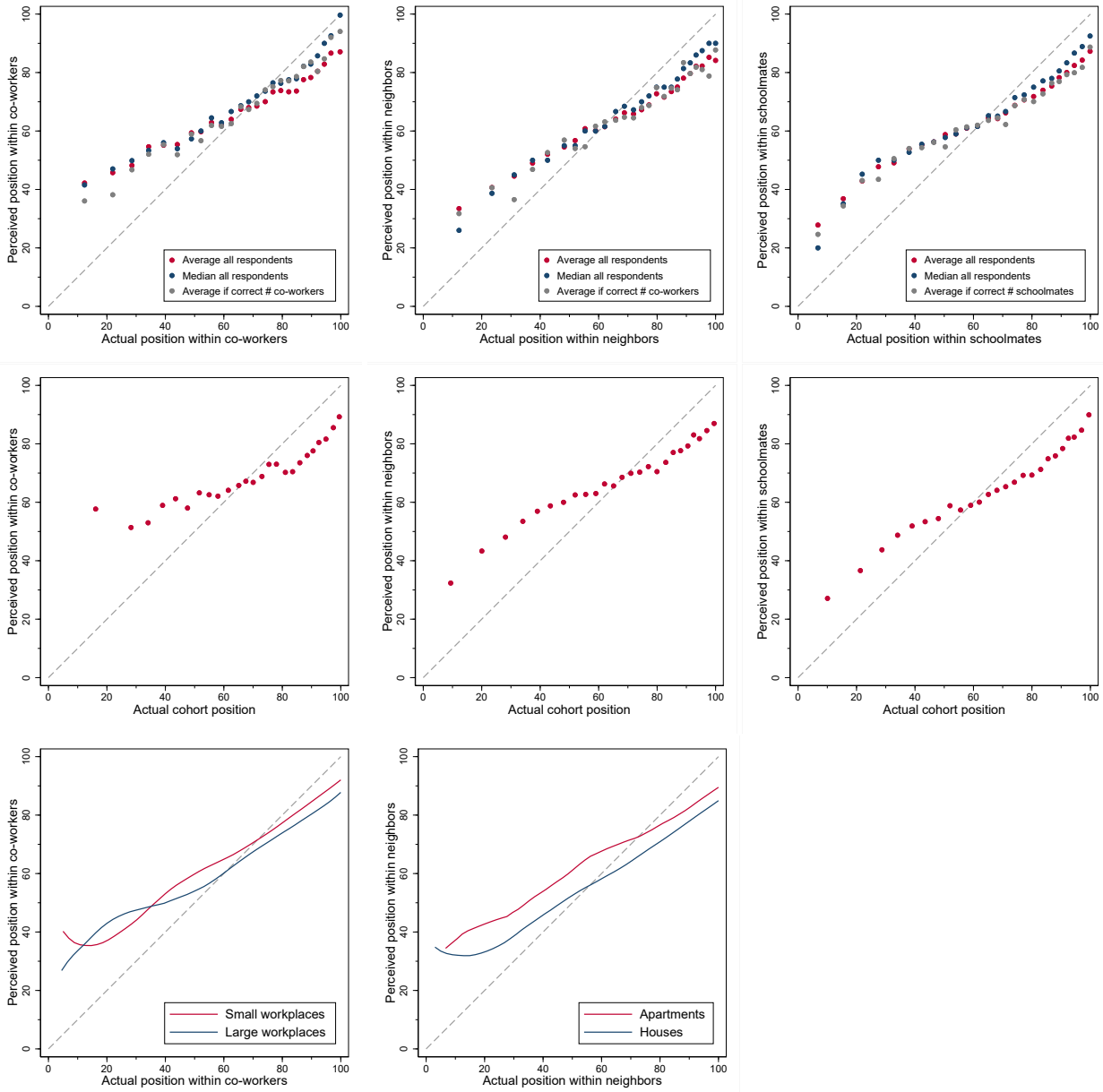
(C) SCHOOLMATES



Notes: The figures show bin scatters of the reported number of co-workers by the actual number of co-workers. In each panel, the sample is restricted to observations where the *Actual number of co-workers* is below a certain threshold. All observations are used to calculate the bin averages but the panels only show the averages if they are smaller than the threshold. There are 25 bins in each panel and there is the same number of observations behind each bin. The bin averages are only plotted if they are lower than the maximum actual number. For *Schoolmates*, the figure is based on respondents enrolled in "Grundskole" (Basic School) at age 15. The figure excludes observations from one very large school.

Figure A-15: Perceived position in small reference groups

Co-workers | Neighbors | Schoolmates

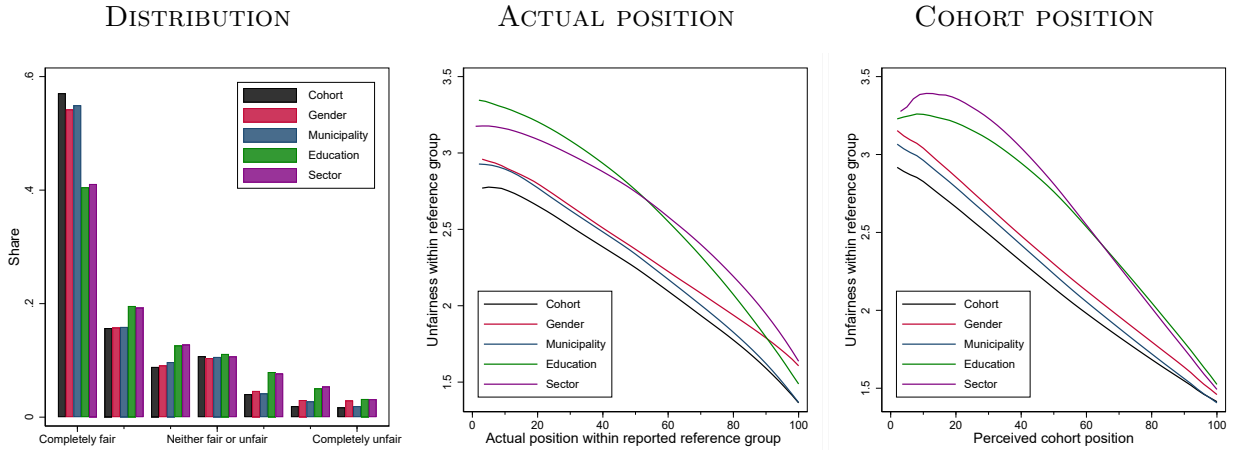


Notes: There are 25 bins in each panel. They are of equal size, except the top bin for co-workers and neighbors in the top panels, which have more observations. The top panels show similar patterns as in figure 8 using medians instead of averages or restricting the sample to respondents who reports a number of people in the small reference group that matches the number observed in the register data ± 10%. In the middle panels, we use actual cohort position instead actual position within the small reference group. Again, we see a pattern similar to figure 8. In the bottom panels, the local linear polynomials have a bandwidth of 10 and are based on the respondents who report the correct number of people in the reference group ±10%. Small workplaces have 10 to 100 employees. Large workplaces have more than 100 employees.

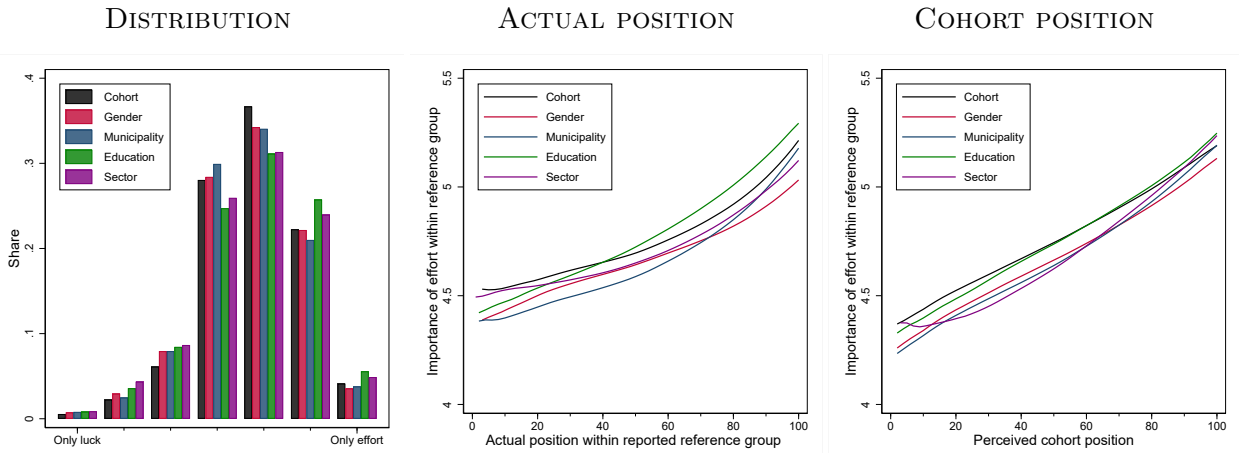
D Relationship Between Social Positions and Fairness Views

FIGURE A-16: UNFAIRNESS OF INEQUALITY AND IMPORTANCE OF EFFORT WITHIN LARGE REFERENCE GROUPS: DISTRIBUTION AND BY POSITION

(A) FAIRNESS



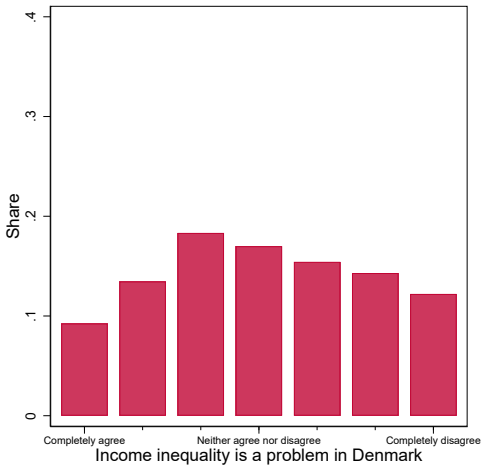
(B) LUCK VS. EFFORT



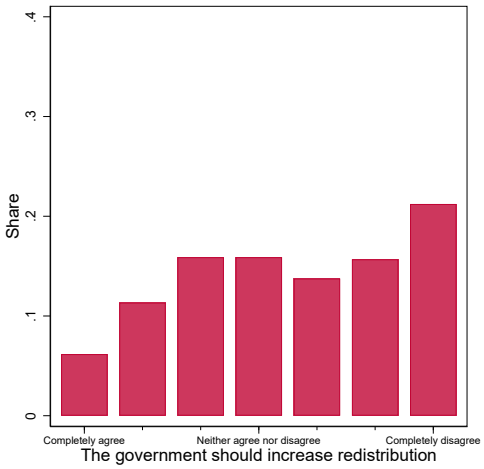
Notes: The figure only uses responses from the control group. The local linear polynomials have a bandwidth of 20. The left column panels show the raw distribution of the answers on the 7 point scale. In the middle column panels, we use actual position within each reference group instead of perceived position as in figure 10. In the right column panels, we use perceived cohort position.

Figure A-17: Distributions of inequality views

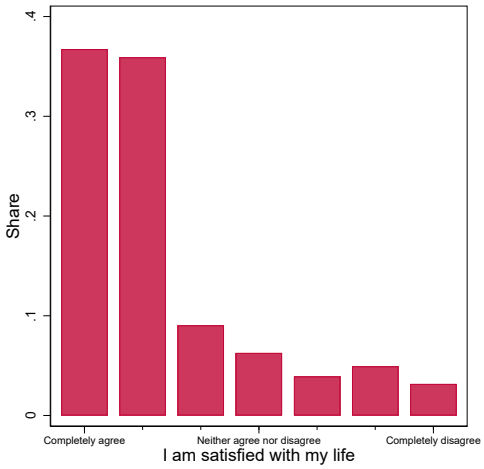
(a) Income inequality



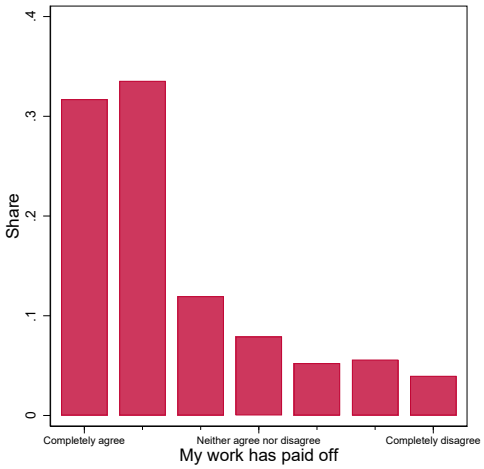
(b) Redistribution



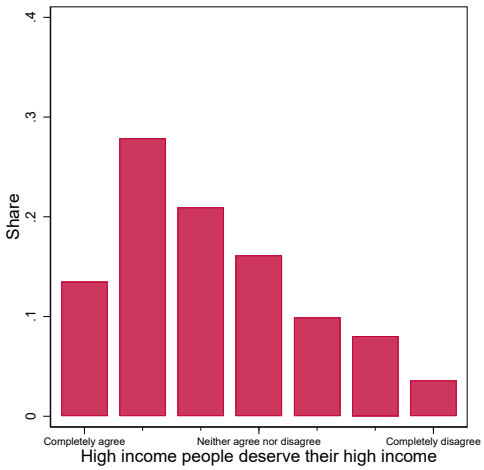
(c) Life satisfaction



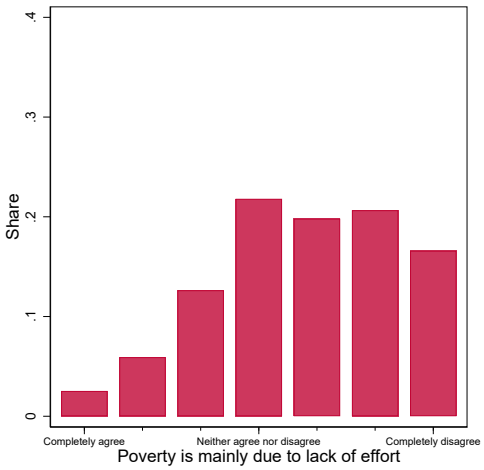
(d) Work paid off



(e) High income deserved



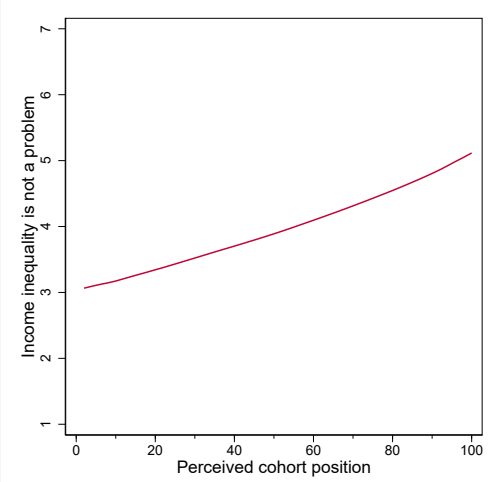
(f) Poverty and effort



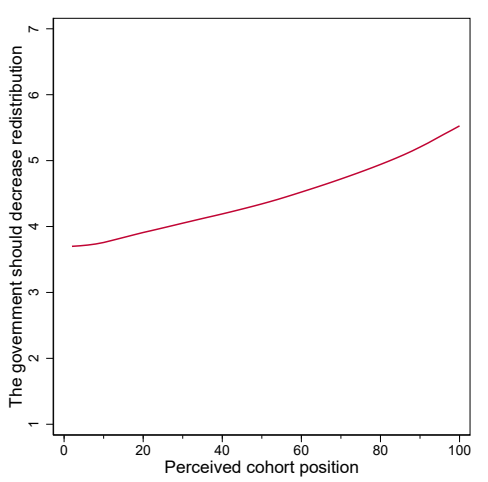
Notes: The figure only uses responses from the control group.

Figure A-18: Inequality views by perceived position

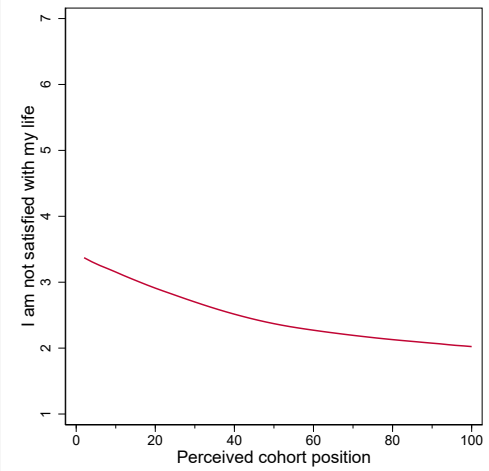
(a) Inequality is not a problem



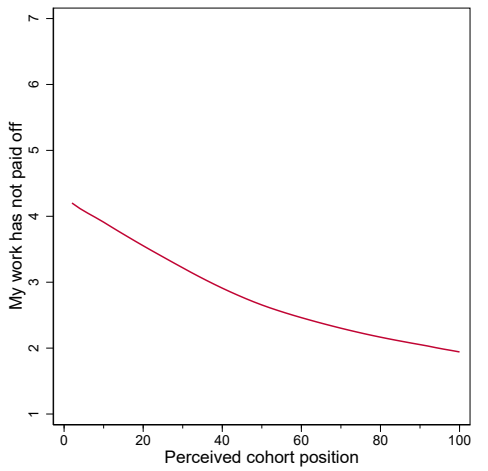
(b) Decrease redistribution



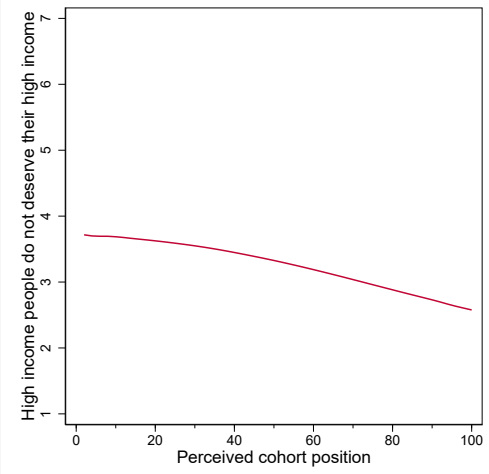
(c) Not satisfied with life



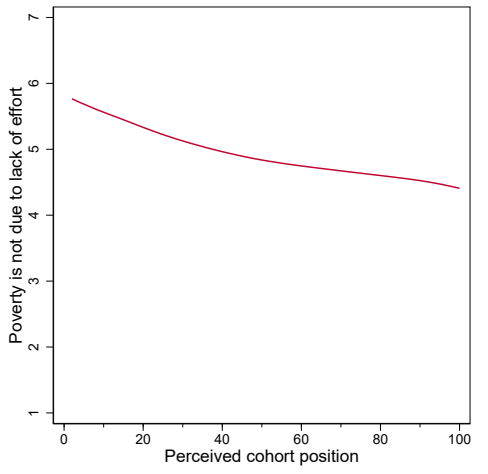
(d) Work has not paid off



(e) High income not deserved



(f) Poverty not due to low effort



Notes: The figure only uses responses from the control group. The local linear polynomials have a bandwidth of 20.

Table A-5: Inequality views by actual position and position misperception

	Inequality is not a problem	Decrease redistribution	Not satisfied with life	Work has not paid off	High inc. people do not deserve inc.	Poverty not due to lack of effort
Panel A: No controls						
Position	2.32***	2.07***	-1.22***	-2.20***	-1.45***	-1.08***
	(0.12)	(0.13)	(0.11)	(0.11)	(0.11)	(0.11)
Misperception	0.95***	0.78***	-0.38*	-1.08***	-0.83***	-0.69***
	(0.18)	(0.19)	(0.16)	(0.16)	(0.16)	(0.16)
Panel B: With controls						
Position	1.17***	1.15***	-0.83***	-1.36***	-1.07***	-0.57***
	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Misperception	0.50***	0.46***	-0.32**	-0.70***	-0.60***	-0.44***
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
N	4690	4690	4690	4690	4690	4690
Outcome mean	4.08	4.52	2.32	2.53	3.19	4.78
	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)

Notes: In the table we only use the control group respondents. All outcomes are z-scores. *Position* denotes the actual cohort position from percentile 1 to 100 divided by 100. A coefficient of 1 means that going from the bottom of the distribution to the top increases the outcome by one standard deviation. Similarly, *Misperception* is the difference between perceived and actual cohort position divided by 100. *Controls* includes cohort fixed effects, an indicator for men, municipality fixed effects, educational level fixed effects and sector (incl. unemployed/not in workforce) fixed effects. *Outcome mean* is the mean of the non-standardized outcome variable. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-6: Pairwise correlations of historic income positions

	-20 yr.	-15 yr.	-10 yr.	-5 yr.	This yr.
-20 yr.	1.00	0.41	0.29	0.22	0.22
-15 yr.	0.41	1.00	0.62	0.54	0.51
-10 yr.	0.29	0.62	1.00	0.70	0.65
-5 yr.	0.22	0.54	0.70	1.00	0.78
This yr.	0.22	0.51	0.65	0.78	1.00

Notes: Based on the full cohorts born between 1969 and 1973. We only include individuals we observe in all years. N=356,556.

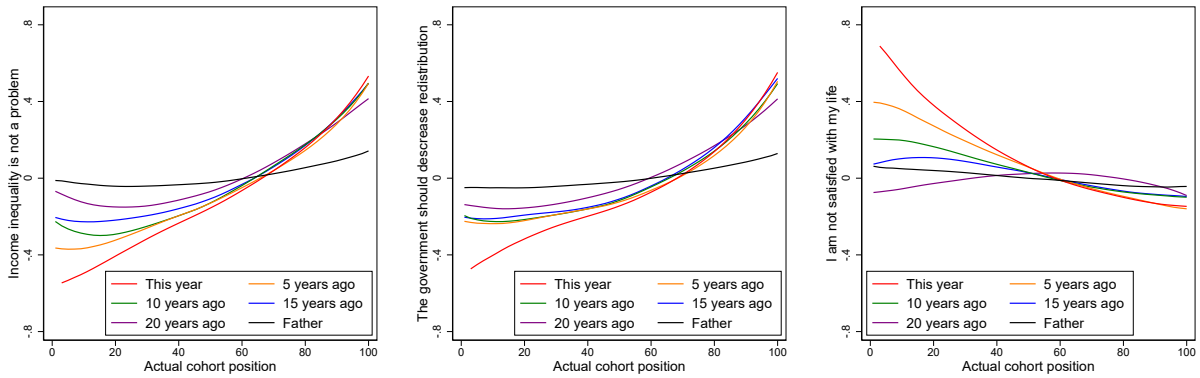
Table A-7: Transition matrix of income position 20 years ago and today

	Quintile today					
	1	2	3	4	5	Total
Quintile 20 years ago						
1	5.2	3.2	3.1	3.9	4.4	19.8
2	5.2	4.7	3.5	3.3	3.2	19.9
3	3.4	6.0	4.9	3.4	2.3	20.1
4	2.0	4.0	5.5	5.0	3.5	20.1
5	1.5	2.1	3.8	5.4	7.3	20.1
Quintile 10 years ago						
1	9.5	4.4	2.0	1.5	1.0	18.3
2	4.0	8.7	4.8	1.9	0.7	20.1
3	1.9	4.4	8.0	4.9	1.3	20.5
4	1.2	1.8	4.7	8.6	4.2	20.6
5	0.8	0.7	1.3	4.2	13.4	20.5
Total	17.4	20.1	20.8	21.1	20.7	100.0

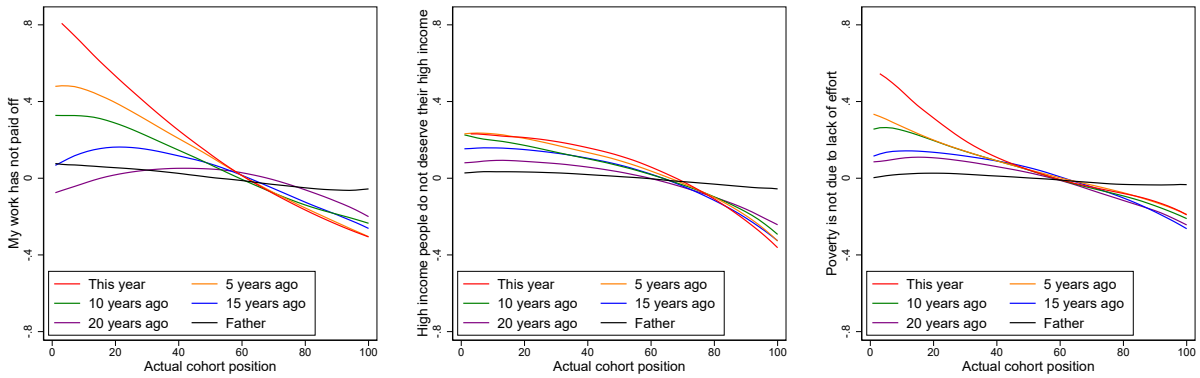
Notes: Based on the full cohorts born between 1969 and 1973. We only include individuals we observe in all years. The columns do not sum to 20% each because immigrants are included when the income percentiles are generated but not in the table, since we do not observe them historically. N=356,556.

FIGURE A-19: HISTORY OF PAST SOCIAL POSITIONS AND INEQUALITY VIEWS

(A) INCOME INEQUALITY (B) REDISTRIBUTION (C) LIFE SATISFACTION



(D) WORK PAID OFF (E) HIGH INCOME DESERVED (F) POVERTY AND EFFORT



Notes: Bandwidth for local linear polynomials is 20. For *Father*, the x-axis is the father's position among fathers when the respondent was 15 years old. In all panels, the y-axis is the z-score for the survey answers. Sample restricted to the control group.

Table A-8: History of past social positions, unfairness, importance of effort and political view without controls

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Position father	-0.050	-0.027	-0.063	-0.040	-0.047	-0.023	0.052
	(0.036)	(0.036)	(0.036)	(0.035)	(0.036)	(0.036)	(0.035)
Position -20 yr.	-0.153***	-0.183***	-0.150***	-0.308***	-0.265***	0.169***	0.557***
	(0.037)	(0.037)	(0.037)	(0.036)	(0.037)	(0.037)	(0.036)
Position -15 yr.	-0.228***	-0.217***	-0.182***	-0.228***	-0.236***	0.171***	0.376***
	(0.048)	(0.047)	(0.047)	(0.047)	(0.048)	(0.048)	(0.047)
Position -10 yr.	-0.099	-0.155**	-0.145*	-0.290***	-0.269***	0.205***	0.197***
	(0.057)	(0.057)	(0.057)	(0.056)	(0.057)	(0.058)	(0.056)
Position -5 yr.	-0.110	-0.093	-0.159*	-0.077	-0.113	-0.009	-0.094
	(0.069)	(0.068)	(0.068)	(0.068)	(0.070)	(0.069)	(0.068)
Position this yr.	-0.739***	-0.725***	-0.764***	-0.716***	-0.858***	0.527***	0.406***
	(0.068)	(0.068)	(0.068)	(0.067)	(0.071)	(0.069)	(0.067)
Observations	9046	9046	9046	9046	8575	9046	9046
Controls							

Notes: All outcomes are z-scores. *Importance of effort* is in the cohort dimension. *Position father* is the repondent's father's income rank when the respondent was 15 years old compared to other fathers of 15 year olds. All positions used as explaining variables have been re-scaled to go from 0.1 to 1. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-9: History of past social positions, unfairness, importance of effort and political view using 5-year average income positions

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Pos. -20 to -16	-0.224***	-0.188**	-0.187**	-0.205***	-0.198***	0.197***	0.566***
	(0.058)	(0.057)	(0.058)	(0.056)	(0.057)	(0.059)	(0.055)
Pos. -15 to -11	-0.143	-0.145*	-0.131	-0.132	-0.121	0.143	0.130
	(0.073)	(0.072)	(0.072)	(0.070)	(0.072)	(0.074)	(0.070)
Pos. -10 to -6	-0.097	-0.096	-0.137	-0.161	-0.145	0.084	0.034
	(0.091)	(0.089)	(0.089)	(0.087)	(0.089)	(0.091)	(0.086)
Pos. -5 to -1	-0.264*	-0.205	-0.266*	-0.263*	-0.259*	0.129	-0.000
	(0.113)	(0.112)	(0.112)	(0.109)	(0.113)	(0.114)	(0.108)
Position this yr.	-0.515***	-0.509***	-0.513***	-0.528***	-0.634***	0.460***	0.470***
	(0.092)	(0.090)	(0.090)	(0.088)	(0.092)	(0.092)	(0.087)
Observations	9388	9388	9388	9388	8895	9388	9388
Controls	✓	✓	✓	✓	✓	✓	✓

Notes: All outcomes are z-scores. *Importance of effort* is in the cohort dimension. *Pos. -20 to -16*, *Pos. -15 to -11*, *Pos. -10 to -6* and *Pos. -5 to -1* are five year average cohort positions. All positions used as explaining variables have been re-scaled to go from 0.1 to 1. *Controls* includes a treatment indicator, cohort fixed effects, an indicator for men, municipality fixed effects, educational level fixed effects and sector (incl. unemployed/not in workforce) fixed effects. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-10: History of past social positions and inequality views

	Inequality is not a problem	Decrease redistribution	Not satisfied with life	Work has not paid off	High inc. people do not deserve inc.	Poverty not due to lack of effort
Position father	0.087*	0.115**	-0.006	0.009	-0.029	-0.019
	(0.035)	(0.036)	(0.038)	(0.037)	(0.037)	(0.037)
Position -20 yr.	0.142***	0.136***	0.000	-0.017	-0.147***	-0.110**
	(0.040)	(0.041)	(0.042)	(0.041)	(0.042)	(0.041)
Position -15 yr.	0.087	0.190***	-0.103*	-0.114*	-0.169***	-0.077
	(0.046)	(0.047)	(0.049)	(0.048)	(0.049)	(0.048)
Position -10 yr.	0.112*	0.040	0.061	-0.021	0.023	0.070
	(0.055)	(0.057)	(0.059)	(0.058)	(0.058)	(0.058)
Position -5 yr.	0.062	0.012	-0.206**	-0.282***	-0.208**	-0.051
	(0.066)	(0.068)	(0.071)	(0.069)	(0.070)	(0.069)
Position this yr.	0.694***	0.700***	-0.455***	-0.714***	-0.551***	-0.261***
	(0.070)	(0.072)	(0.075)	(0.073)	(0.074)	(0.073)
Observations	9036	9036	9036	9036	9036	9036
Controls	✓	✓	✓	✓	✓	✓

Notes: All outcomes are z-scores. *Position father* is the repondent's father's income rank when the respondent was 15 years old compared to other fathers of 15 year olds. All positions used as explaining variables have been re-scaled to go from 0.1 to 1. *Controls* includes a treatment indicator, cohort fixed effects, an indicator for men, municipality fixed effects, educational level fixed effects and sector (incl. unemployed/not in workforce) fixed effects. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-11: Historic shocks and inequality views

	Inequality is not a problem	Decrease redistribution	Not satisfied with life	Work has not paid off	High inc. people do not deserve inc.	Poverty not due to lack of effort	N	Affected %
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployment	-0.16**	-0.12*	0.15**	0.17***	0.11*	-0.029	7531	5.03
	(0.050)	(0.050)	(0.052)	(0.051)	(0.052)	(0.051)		
Disability	-0.29*	-0.44***	0.29*	0.37**	0.26	0.50***	9238	0.60
	(0.13)	(0.13)	(0.14)	(0.13)	(0.14)	(0.13)		
Hospitalization	-0.035	-0.012	0.076**	0.075**	0.057*	0.066*	4746	55.6
	(0.028)	(0.028)	(0.029)	(0.029)	(0.029)	(0.028)		
Promotion	0.19***	0.20***	-0.13**	-0.10*	-0.17***	-0.052	7964	6.65
	(0.043)	(0.044)	(0.045)	(0.045)	(0.045)	(0.045)		
Pre-shock position FE	✓	✓	✓	✓	✓	✓		
Controls	✓	✓	✓	✓	✓	✓		

Notes: All outcomes are z-scores. Each cell in the table is a separate regression of the column outcome on the row regressor and the controls indicated in the bottom part of the table. The explaining variables are all indicators that equal 1 if the respondent experienced the shock between 2012 and 2017. In each row, we exclude respondents who experienced the shock between 2008 and 2011. For *Unemployment*, we only use respondents who were in the workforce in the entire period. *Controls* includes cohort fixed effects, an indicator for men, municipality fixed effects, educational level fixed effects and sector (incl. unemployed/not in workforce) fixed effects, all measured in 2008, and a treatment indicator. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-12: Historic shocks, unfairness, importance of effort and political views with last vote fixed effects

	Unfairness of inequality					Importance	Right-	N	Affected
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing		%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Unemployment	0.17***	0.20***	0.18***	0.15**	0.18***	-0.088	-0.036	7537	5.03
	(0.050)	(0.049)	(0.049)	(0.048)	(0.050)	(0.051)	(0.034)		
Disability	0.15	0.40**	0.28*	0.13		-0.19	0.030	9246	0.61
	(0.13)	(0.13)	(0.13)	(0.12)		(0.13)	(0.087)		
Hospitalization	0.090**	0.076**	0.086**	0.059*	0.039	-0.0093	-0.021	4749	55.5
	(0.028)	(0.028)	(0.028)	(0.027)	(0.027)	(0.029)	(0.019)		
Promotion	-0.068	-0.066	-0.066	-0.11**	-0.16***	0.098*	0.072*	7970	6.66
	(0.044)	(0.044)	(0.044)	(0.043)	(0.043)	(0.045)	(0.030)		
Pre-shock position FE	✓	✓	✓	✓	✓	✓	✓		
Controls	✓	✓	✓	✓	✓	✓	✓		
Last vote FE	✓	✓	✓	✓	✓	✓	✓		

Notes: All outcomes z-scores. Each cell in the table is a separate regression of the column outcome on the row regressor and the controls indicated in the bottom part of the table. The explaining variables are all indicators that equal 1 if the respondent experienced the shock between 2012 and 2017. In each row, we exclude respondents who already experienced this type of shock in the pre-period (2008-2011). For *Unemployment*, we only use respondents who were in the workforce in the entire period. For *Disability*, we do not estimate the effect on fairness within sector, because very few disabled people work. *Controls* included in all regressions are cohort, gender, municipality, education and sector fixed effects (incl. unemployed/not in workforce), all measured in 2008, and a treatment indicator. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-13: Historic shocks, unfairness, importance of effort and political view without controls

	Current	Unfairness of inequality					Importance	Right-	N	Affected
	position	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing		%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Unemployment	-12.3***	0.17**	0.19***	0.18***	0.098	0.13*	-0.069	0.024	7537	5.03
	(0.81)	(0.051)	(0.050)	(0.050)	(0.050)	(0.052)	(0.051)	(0.051)		
Disability	-24.8***	0.32*	0.56***	0.44***	0.26*		-0.31*	-0.17	9246	0.61
	(2.40)	(0.13)	(0.13)	(0.13)	(0.13)		(0.13)	(0.13)		
Hospitalization	-2.20***	0.11***	0.098***	0.11***	0.080**	0.065*	-0.022	-0.046	4749	55.5
	(0.51)	(0.029)	(0.028)	(0.028)	(0.028)	(0.028)	(0.029)	(0.029)		
Promotion	8.86***	-0.13**	-0.12**	-0.13**	-0.16***	-0.22***	0.15**	0.20***	7970	6.66
	(0.77)	(0.045)	(0.044)	(0.045)	(0.044)	(0.045)	(0.045)	(0.045)		
Pre-shock position FE	✓	✓	✓	✓	✓	✓	✓	✓		
Controls										

Notes: All outcomes are z-scores. Each cell in the table is a separate regression of the column outcome on the row regressor and the controls indicated in the bottom part of the table. The explaining variables are all indicators that equal 1 if the respondent experienced the shock between 2012 and 2017. In each row, we exclude respondents who experienced the shock between 2008 and 2011. For *Unemployment*, we only use respondents who were in the workforce in the entire period. For *Disability*, we do not estimate the effect on fairness within sector, because very few disabled people work. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-14: Historic shocks, unfairness, importance of effort and political view using 2SLS

	Unfairness of inequality					Importance	Right-	N	Affected
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing		%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Unemployment	-1.60***	-1.77***	-1.71***	-1.34***	-2.34***	0.87*	0.50	7537	5.03
	(0.41)	(0.39)	(0.41)	(0.37)	(0.60)	(0.42)	(0.39)		
Disability	-1.35*	-2.31***	-1.84**	-1.27*		1.42*	1.14*	9246	0.61
	(0.60)	(0.58)	(0.57)	(0.59)		(0.61)	(0.57)		
Hospitalization	-5.11**	-3.84*	-4.81*	-3.45	-2.64	0.55	0.97	4749	55.5
	(1.93)	(1.55)	(1.87)	(1.77)	(2.32)	(1.56)	(1.48)		
Promotion	-1.45**	-1.31**	-1.36**	-1.69***	-1.99***	1.69**	2.28***	7970	6.66
	(0.52)	(0.50)	(0.50)	(0.43)	(0.43)	(0.53)	(0.52)		
Pooled	-1.61***	-1.93***	-1.75***	-1.49***	-2.15***	1.25***	1.08***	29502	12.2
	(0.34)	(0.33)	(0.33)	(0.30)	(0.35)	(0.31)	(0.31)		
Pre-shock position FE	✓	✓	✓	✓	✓	✓	✓		
Controls	✓	✓	✓	✓	✓	✓	✓		

Notes: All outcomes are z-scores. Each cell in the table is a separate 2SLS regression of the column outcome on current position instrumented using the row regressor and the controls indicated in the bottom part of the table. The instruments are all indicators that equal 1 if the respondent experienced the shock between 2012 and 2017. In each row, we exclude respondents who experienced the shock between 2008 and 2011. For *Unemployment*, we only use respondents who were in the workforce in the entire period. For *Disability*, we do not estimate the effect on fairness within sector, because very few disabled people work. *Controls* includes cohort fixed effects, an indicator for men, municipality fixed effects, educational level fixed effects and sector (incl. unemployed/not in workforce) fixed effects, all measured in 2008, and a treatment indicator. Standard errors in parentheses. In the pooled regression we cluster the standard errors at the individual level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-15: Survey information experiment and unfairness, importance of effort and political view with same treatment direction across all reference groups

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Positive misperception	-0.149**	-0.065	-0.134**	-0.229***	-0.186***	0.146**	0.120*
	(0.053)	(0.052)	(0.052)	(0.051)	(0.056)	(0.054)	(0.052)
T × Positive	0.205***	0.112*	0.159**	0.134**	0.150**	-0.027	-0.027
	(0.050)	(0.050)	(0.050)	(0.048)	(0.051)	(0.051)	(0.049)
T × Negative	0.038	0.013	0.032	0.037	0.010	0.029	-0.044
	(0.035)	(0.035)	(0.035)	(0.034)	(0.035)	(0.036)	(0.035)
N	4701	4701	4701	4701	4385	4701	4701
Position FE	✓	✓	✓	✓	✓	✓	✓

Notes: All outcomes are z-scores. *Positive misperception* is an indicator that equals 1 if the perceived position is larger than the actual position. $T \times$ *Positive* and $T \times$ *Negative* are interactions of the treatment indicator and the positive and 0 or negative misperception indicators. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-16: Survey information experiment and unfairness, importance of effort and political view by treatment intensity

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Negative misperception	-0.025	-0.088*	-0.083*	-0.118**	-0.152***	0.019	-0.020
	(0.035)	(0.035)	(0.036)	(0.039)	(0.040)	(0.035)	(0.035)
Positive misperception	-0.167***	-0.147**	-0.176***	-0.150***	-0.318***	0.083	0.041
	(0.046)	(0.045)	(0.044)	(0.042)	(0.044)	(0.046)	(0.046)
Large positive misperception	-0.112*	-0.225***	-0.187***	-0.221***	-0.434***	0.174***	0.206***
	(0.051)	(0.050)	(0.047)	(0.046)	(0.050)	(0.051)	(0.050)
T × Large negative	0.014	0.023	0.033	0.050	0.013	0.031	-0.034
	(0.035)	(0.035)	(0.035)	(0.038)	(0.040)	(0.035)	(0.035)
T × Negative	0.031	0.021	0.020	0.033	-0.005	-0.018	-0.023
	(0.033)	(0.034)	(0.035)	(0.037)	(0.038)	(0.034)	(0.033)
T × Positive	0.137**	-0.017	0.091	0.022	0.038	0.014	-0.014
	(0.052)	(0.050)	(0.049)	(0.041)	(0.043)	(0.052)	(0.051)
T × Large positive	0.175**	0.187***	0.107*	0.099*	0.140**	-0.035	-0.009
	(0.054)	(0.052)	(0.050)	(0.042)	(0.044)	(0.055)	(0.054)
N	9331	9331	9331	9331	8854	9331	9331
Position FE	✓	✓	✓	✓	✓	✓	✓

Notes: All outcomes are z-scores. First we divide respondents into those who have positive and negative misperceptions. For each of these groups we divide the respondents into two similar sized groups based on how large their misperceptions are. The baseline group is respondents with large negative misperceptions. This for instance means that within cohort, they think their position is more than 12 position lower than it really is (for the other groups, the intervals are $[-12, 0], [1, 10]$ and larger than 10). For the *Importance of effort* and *Right-wing* outcomes, we use cohort misperception. "$T \times$" are interactions of the treatment indicator and the different group indicators. In the regressions we also include a constant term. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE A-17: SURVEY INFORMATION EXPERIMENT AND UNFAIRNESS, IMPORTANCE OF EFFORT AND POLITICAL VIEW BY ECONOMIC POLICY VIEW

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Negative misperception of left-wing	0.397***	0.345***	0.348***	0.338***	0.431***	-0.198***	-0.755***
	(0.043)	(0.043)	(0.044)	(0.050)	(0.049)	(0.043)	(0.037)
Negative misperception of right-wing	-0.263***	-0.290***	-0.285***	-0.284***	-0.290***	0.270***	0.774***
	(0.041)	(0.042)	(0.042)	(0.044)	(0.046)	(0.041)	(0.036)
Positive misperception of left-wing	0.224***	0.218***	0.284***	0.345***	0.193***	-0.210***	-0.734***
	(0.060)	(0.059)	(0.056)	(0.049)	(0.053)	(0.060)	(0.052)
Positive misperception of moderate	-0.083	-0.083	-0.131**	-0.125**	-0.243***	0.113**	0.087*
	(0.044)	(0.043)	(0.042)	(0.039)	(0.042)	(0.044)	(0.038)
Positive misperception of right-wing	-0.380***	-0.415***	-0.416***	-0.463***	-0.553***	0.424***	0.821***
	(0.062)	(0.058)	(0.057)	(0.053)	(0.054)	(0.063)	(0.054)
T × Positive left-wing	0.102	0.026	-0.086	0.006	0.028	0.032	0.032
	(0.078)	(0.076)	(0.071)	(0.057)	(0.064)	(0.079)	(0.068)
T × Positive moderate	0.175***	0.081	0.157***	0.082*	0.128**	-0.009	-0.022
	(0.048)	(0.047)	(0.046)	(0.039)	(0.040)	(0.049)	(0.042)
T × Positive right-wing	0.168*	0.161*	0.144	0.126*	0.116	-0.078	-0.088
	(0.082)	(0.075)	(0.076)	(0.064)	(0.063)	(0.082)	(0.071)
T × Negative left-wing	-0.047	-0.009	-0.027	-0.030	-0.076	-0.051	0.017
	(0.050)	(0.051)	(0.052)	(0.059)	(0.057)	(0.051)	(0.044)
T × Negative moderate	0.031	0.038	0.034	0.076*	0.028	0.042	-0.032
	(0.033)	(0.033)	(0.033)	(0.035)	(0.037)	(0.033)	(0.029)
T × Negative right-wing	0.060	0.012	0.056	0.005	-0.008	-0.015	-0.046
	(0.047)	(0.048)	(0.048)	(0.050)	(0.052)	(0.047)	(0.041)
N	9331	9331	9331	9331	8854	9331	9331
Position FE	✓	✓	✓	✓	✓	✓	✓

Notes: All outcomes are z-scores. We divide the respondents into six groups based on whether they have positive or negative misperceptions and their economic policy view, i.e. whether they are Very left-wing/Left-wing, Moderate or Right-wing/Very-right-wing. We include an indicator for each group and the baseline group is respondents who have a moderate economic policy view and a negative misperception. "$T \times$" are interactions of the treatment indicator and the different group indicators. In the regressions we also include a constant term. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-18: Survey information experiment and inequality views

	Inequality is not a problem	Decrease redistribution	Not satisfied with life	Work has not paid off	High inc. people do not deserve inc.	Poverty not due to lack of effort
Positive misperception	0.121***	0.113***	-0.082*	-0.155***	-0.148***	-0.125***
	(0.033)	(0.034)	(0.035)	(0.034)	(0.034)	(0.034)
T × Positive	-0.021	0.027	-0.007	0.031	0.047	0.016
	(0.036)	(0.037)	(0.038)	(0.037)	(0.038)	(0.037)
T × Negative	-0.012	0.013	0.016	0.015	-0.008	0.020
	(0.023)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
N	9323	9323	9323	9323	9323	9323
Position FE	✓	✓	✓	✓	✓	✓

Notes: All outcomes are z-scores. *Positive misperception* is an indicator that equals 1 if the perceived position is larger than the actual position. $T \times$ *Positive* and $T \times$ *Negative* are interactions of the treatment indicator and the positive and 0 or negative misperception indicators. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-19: Survey information experiment and unfairness, importance of effort and political view with controls

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Positive misperception	-0.134***	-0.070*	-0.107**	-0.081**	-0.184***	0.118***	0.122***
	(0.034)	(0.033)	(0.033)	(0.031)	(0.033)	(0.034)	(0.033)
T × Positive	0.170***	0.082*	0.103**	0.065*	0.091**	-0.020	-0.036
	(0.037)	(0.035)	(0.035)	(0.029)	(0.030)	(0.037)	(0.035)
T × Negative	0.022	0.029	0.025	0.041	0.005	0.007	-0.023
	(0.024)	(0.024)	(0.024)	(0.026)	(0.027)	(0.024)	(0.023)
N	9331	9331	9331	9331	8854	9331	9331
Position FE	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓

Notes: All outcomes are z-scores. *Positive misperception* is an indicator that equals 1 if the perceived position is larger than the actual position. $T \times$ *Positive* and $T \times$ *Negative* are interactions of the treatment indicator and the positive and 0 or negative misperception indicators. *Controls* includes cohort fixed effects, an indicator for men, municipality fixed effects, educational level fixed effects and sector (incl. unemployed/not in workforce) fixed effects. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-20: Survey information experiment and unfairness, importance of effort and political view if actual and reported income match

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Positive misperception	-0.065	-0.111**	-0.120**	-0.077*	-0.221***	0.016	0.057
	(0.041)	(0.040)	(0.039)	(0.037)	(0.041)	(0.042)	(0.042)
T × Positive	0.137**	0.137**	0.106*	0.036	0.078*	0.053	-0.055
	(0.046)	(0.045)	(0.043)	(0.036)	(0.038)	(0.046)	(0.046)
T × Negative	0.027	0.001	0.023	0.013	-0.010	0.017	-0.030
	(0.027)	(0.028)	(0.027)	(0.031)	(0.032)	(0.027)	(0.027)
N	6660	6537	6539	6272	5873	6660	6660
Position FE	✓	✓	✓	✓	✓	✓	✓

Notes: In this table, we only use respondents whose reported income generate treatment information that is at most five positions from the information they would have received if the reported and actual income exactly matched. All outcomes are z-scores. *Positive misperception* is an indicator that equals 1 if the perceived position is larger than the actual position. *T* × *Positive* and *T* × *Negative* are interactions of the treatment indicator and the positive and 0 or negative misperception indicators. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-21: Survey information experiment and unfairness, importance of effort and political view with interaction of treatment and high income

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Positive misperception	-0.130***	-0.134***	-0.121***	-0.091**	-0.253***	0.070	0.112**
	(0.036)	(0.035)	(0.034)	(0.034)	(0.037)	(0.036)	(0.036)
T × Positive	0.157***	0.076	0.123**	0.082*	0.105**	-0.076	-0.021
	(0.042)	(0.041)	(0.041)	(0.033)	(0.035)	(0.042)	(0.042)
T × Negative	0.029	0.008	0.077	0.101*	0.051	-0.150**	-0.047
	(0.051)	(0.051)	(0.050)	(0.049)	(0.055)	(0.051)	(0.051)
T × High income	-0.006	0.016	-0.058	-0.068	-0.051	0.181***	0.023
	(0.052)	(0.052)	(0.050)	(0.048)	(0.053)	(0.052)	(0.052)
N	9331	9331	9331	9331	8854	9331	9331
Position FE	✓	✓	✓	✓	✓	✓	✓

Notes: All outcomes are z-scores. *Positive misperception* is an indicator that equals 1 if the perceived position is larger than the actual position. *T* × *Positive* and *T* × *Negative* are interactions of the treatment indicator and the positive and 0 or negative misperception indicators. *T* × *High income* is an interaction of the treatment indicator and an indicator that equals 1 if the individual has a position in the group above 50. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-22: All outcomes and sharpened q-values

	Unfairness of inequality					Importance of effort					Inequality is	Decrease	Not satisfied	Work has not	High inc. people	Poverty not due	Right-
	Cohort	Gender	Mun.	Edu.	Sector	Cohort	Gender	Mun.	Edu.	Sector	not a problem	redistribution	with life	paid off	do not deserve inc.	to lack of effort	wing
Positive misperception	-0.13	-0.13	-0.13	-0.11	-0.27	0.11	0.11	0.05	0.07	0.13	0.12	0.11	-0.08	-0.15	-0.15	-0.13	0.12
p-value	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.002)	(0.108)	(0.022)	(0.000)	(0.000)	(0.001)	(0.019)	(0.000)	(0.000)	(0.000)	(0.001)
T × Positive	0.15	0.08	0.10	0.06	0.09	-0.01	0.01	0.04	0.02	0.03	-0.02	0.03	-0.01	0.03	0.05	0.02	-0.01
p-value	(0.000)	(0.023)	(0.005)	(0.042)	(0.004)	(0.790)	(0.832)	(0.329)	(0.583)	(0.374)	(0.563)	(0.477)	(0.876)	(0.394)	(0.214)	(0.639)	(0.731)
sharpened q-value	[0.001]	[0.217]	[0.059]	[0.337]	[0.059]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]
T × Negative	0.02	0.02	0.03	0.04	0.00	0.01	0.01	-0.01	0.01	0.05	-0.01	0.01	0.02	0.02	-0.01	0.02	-0.03
p-value	(0.336)	(0.371)	(0.258)	(0.099)	(0.857)	(0.805)	(0.762)	(0.785)	(0.843)	(0.061)	(0.632)	(0.569)	(0.515)	(0.508)	(0.717)	(0.411)	(0.252)
sharpened q-value	[1.000]	[1.000]	[1.000]	[0.656]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[0.419]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]
N	9331	9331	9331	9331	8854	9331	9331	9329	9331	8854	9329	9328	9328	9326	9328	9329	9331
Position FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

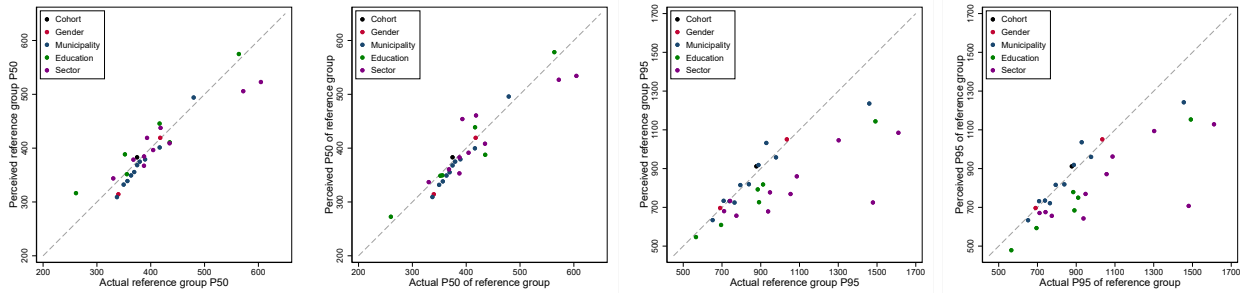
Notes: All outcomes are z-scores. The *sharpened q-value* are sharpened two-stage q-values as introduced by Benjamini et al. (2006) and described by Anderson (2008).

E Large Reference Groups: Using Actual Groups and Restricted Sample

FIGURE A-20: PERCEIVED P50 AND P95 INCOMES FOR LARGE REFERENCE GROUPS USING ACTUAL GROUPS AND RESTRICTED SAMPLE

(A) P50 (B) P95

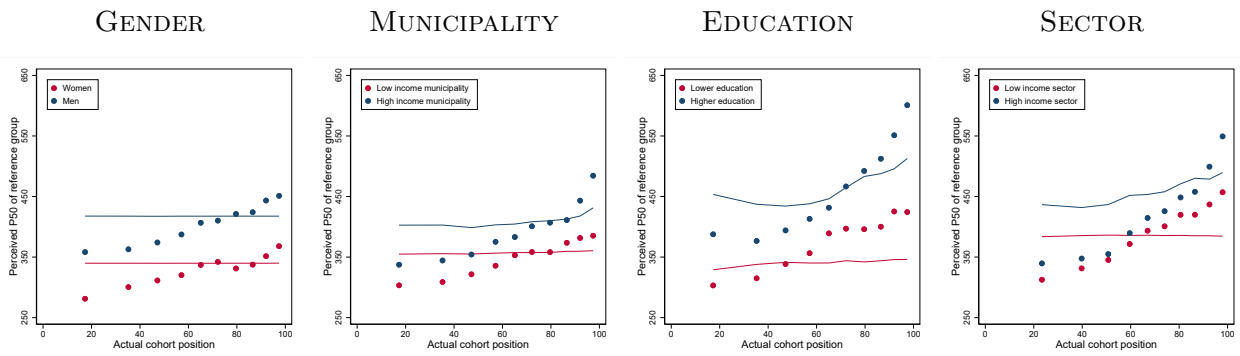
ACTUAL GROUPS REF. GROUPS MATCH ACTUAL GROUPS REF. GROUPS MATCH



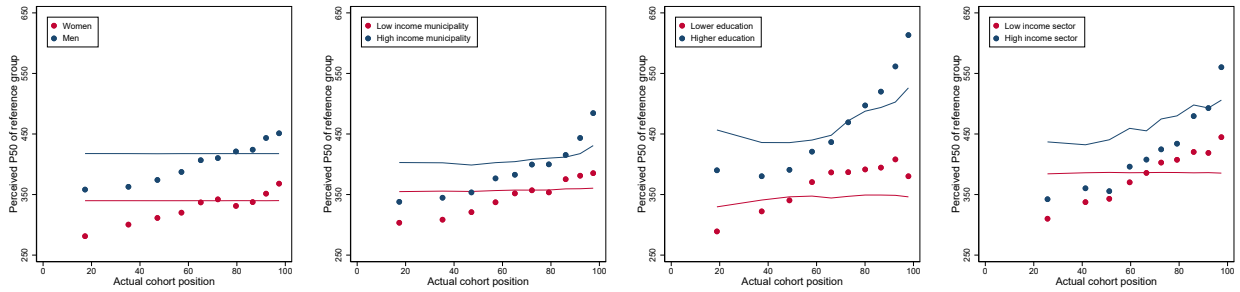
Notes: In the first and third panels, we use actual reference group instead of reported reference group. In the second and fourth panels, we restrict the sample and only include respondents in each reference group if the reported group matches the group observed in the register data. For gender, we show one scatter for men and one for women. For municipality we divide the respondents into 10 similar sized groups based on the actual municipality P50 and P95 income and plot one scatter for each group. For education and sector we show one scatter for each educational level or sector. The scatters show the means of the reported P50 or P95 winzorized at the 5th and 95th percentile within the group.

FIGURE A-21: PERCEIVED P50 INCOMES FOR LARGE REFERENCE GROUPS USING ACTUAL GROUPS AND RESTRICTED SAMPLE

(A) ACTUAL REFERENCE GROUPS



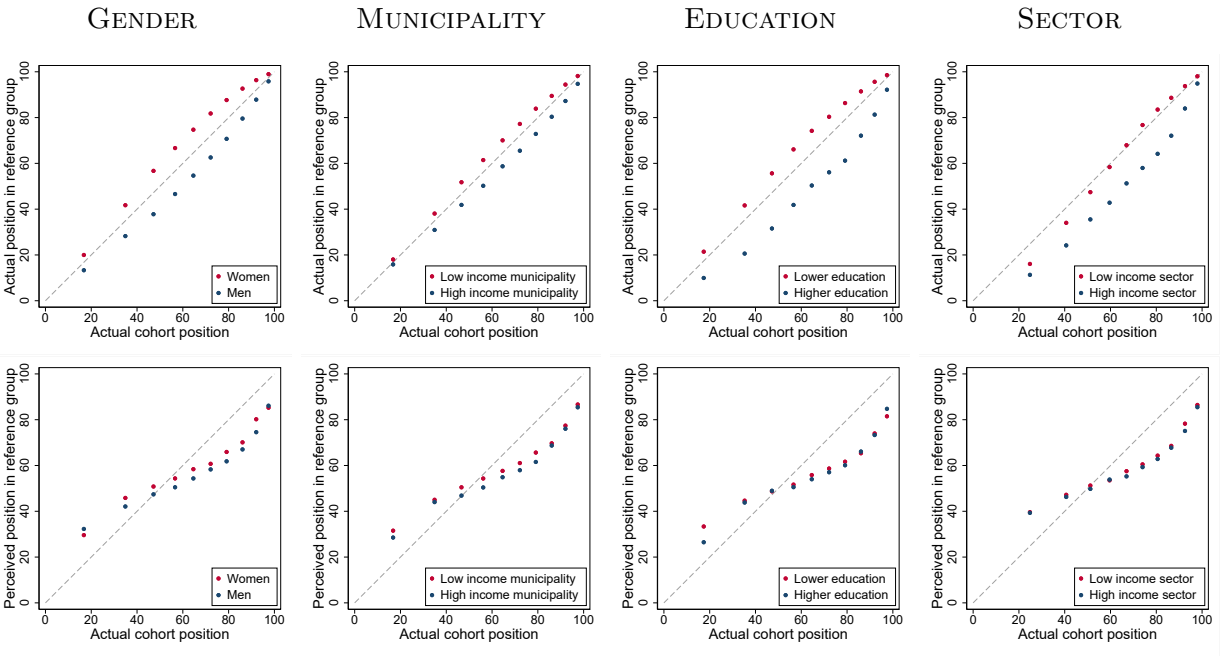
(B) REFERENCE GROUPS MATCH



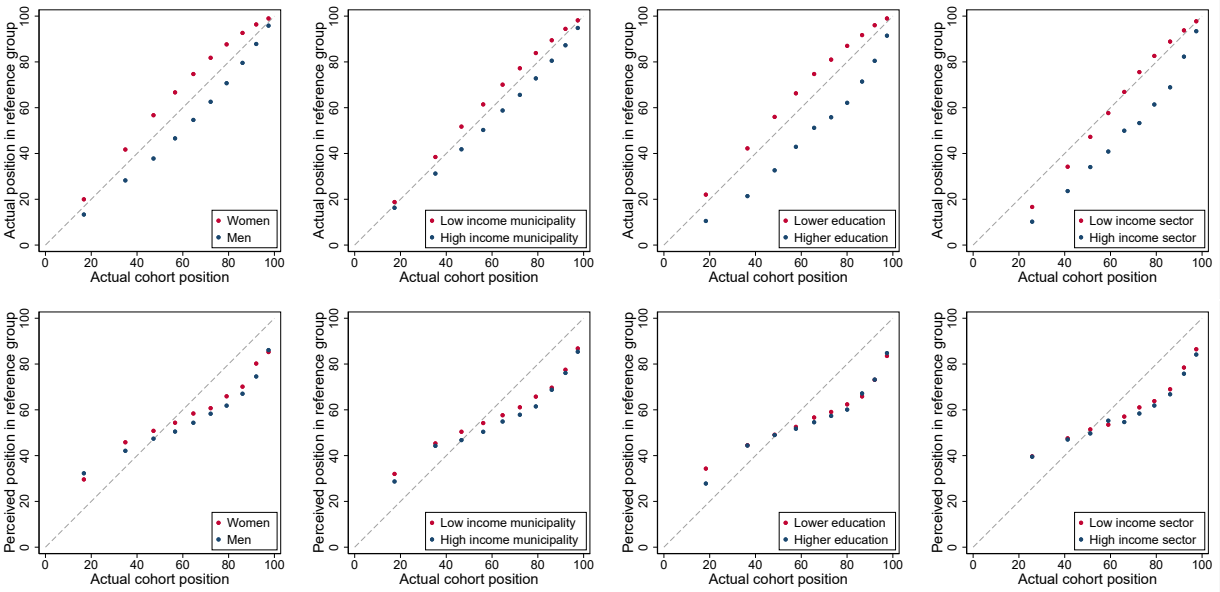
Notes: In the top panels, we use actual reference group instead of reported reference group. For each reference group, the bottom panels only include respondents whose reported reference group matches the actual reference group. The solid lines indicate the actual average P50 for each group within the bin. The high/low income split for municipality is based on the median of within cohort in sample actual municipality P50 income. This is also the case for sector. For education, *Higher education* is short cycle higher education, bachelor programs and master programs.

Figure A-22: Correlation between actual cohort position and within large reference groups using actual groups and restricted sample

(a) Actual reference group



(b) Reference groups match

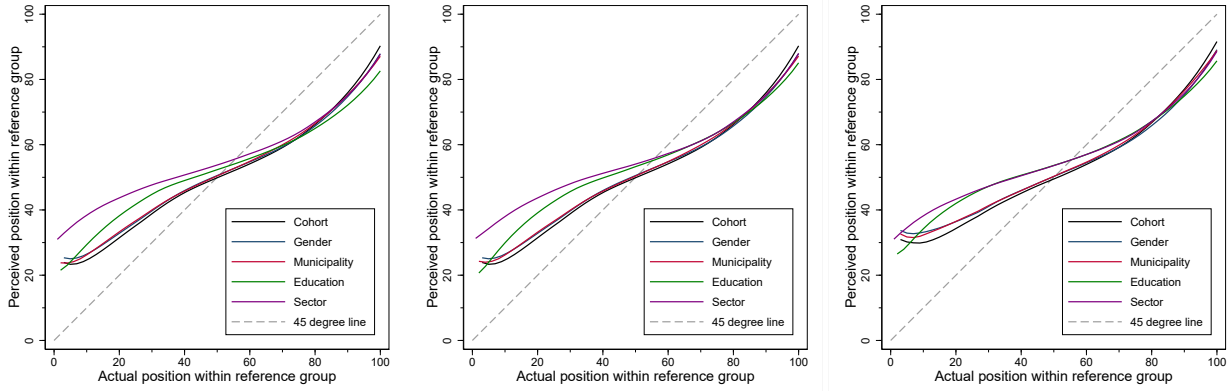


Notes: In Panel A, we use actual reference groups instead of reported reference groups. For each reference group, the figures in Panel B only include respondents whose reported reference group matches the actual reference group. The high/low income split for municipality is based on the median of within cohort in sample actual municipality P50 income. This is also the case for sector. For education, *Higher education* is short cycle higher education, bachelor programs and master programs.

FIGURE A-23: PERCEIVED AND ACTUAL POSITION FOR LARGE REFERENCE GROUPS USING ACTUAL GROUPS AND RESTRICTED SAMPLE

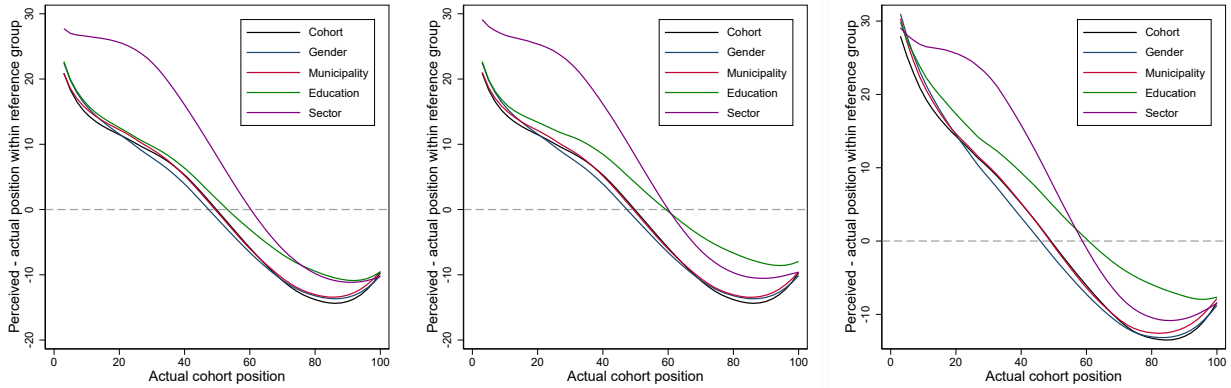
(A) WITHIN REFERENCE GROUP

ACTUAL GROUPS | EACH GROUP MATCHES | ALL GROUPS MATCH



(B) WITHIN COHORT

ACTUAL GROUPS | EACH GROUP MATCHES | ALL GROUPS MATCH

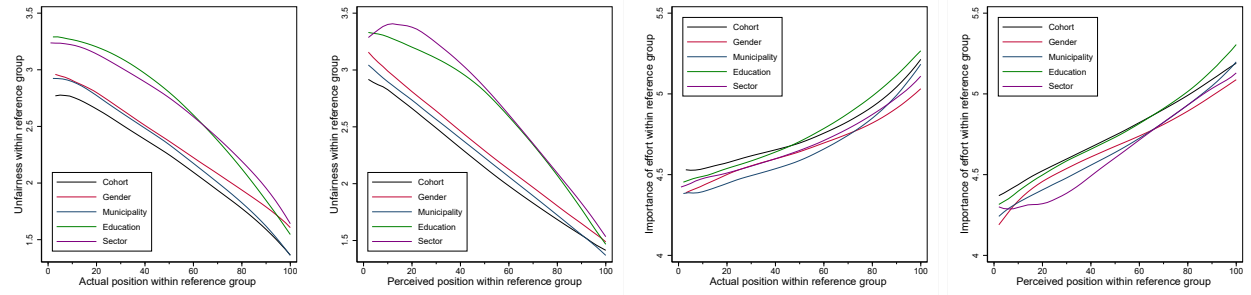


Notes: In the left panels, we use actual reference groups instead of reported reference groups. In the middle panels, we only use respondents in each reference group if the reported group matches the group observed in the register data. In the right panels, only respondents where all reported groups match the groups in the register data are included and the sample is the same across groups. The local linear polynomials have a bandwidth of 10.

FIGURE A-24: VIEW ON FAIRNESS AND EFFORT VS. LUCK WITHIN LARGE REFERENCE GROUPS USING ACTUAL GROUPS AND RESTRICTED SAMPLE

(A) FAIRNESS (B) LUCK VS. EFFORT

ACTUAL GROUPS REF. GROUPS MATCH ACTUAL GROUPS REF. GROUPS MATCH



Notes: The figure only uses responses from the control group. The local linear polynomials have a bandwidth of 20. In the first and third panels, we use actual reference groups instead of reported reference groups. In the second and fourth panels, we only include respondents for each group if the reported group matches the group observed in the register data.

TABLE A-23: UNFAIRNESS, IMPORTANCE OF EFFORT AND POLITICAL VIEW BY ACTUAL POSITION AND POSITION MISPERCEPTION USING ACTUAL REFERENCE GROUPS

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Panel A: No controls							
Position	-1.18***	-1.13***	-1.27***	-1.38***	-1.44***	0.82***	0.90***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Misperception	-0.38***	-0.61***	-0.48***	-0.43***	-0.83***	0.44***	0.49***
	(0.10)	(0.09)	(0.09)	(0.08)	(0.09)	(0.10)	(0.10)
Panel B: With controls							
Position	-1.09***	-1.01***	-1.10***	-1.04***	-1.22***	0.92***	0.99***
	(0.09)	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)	(0.08)
Misperception	-0.40***	-0.41***	-0.41***	-0.28***	-0.54***	0.47***	0.54***
	(0.10)	(0.10)	(0.09)	(0.09)	(0.09)	(0.10)	(0.10)
N	4692	4692	4692	4692	4332	4692	4692

Notes: In the table, we only use the control group respondents and use actual reference groups instead of reported groups. All outcomes are z-scores. *Position* denotes the actual position within reference group from percentile 1 to 100 divided by 100. Similarly, *Misperception* is the difference between perceived and actual position within the reference group divided by 100. *Controls* includes cohort fixed effects, an indicator for men, municipality fixed effects, educational level fixed effects and sector (incl. unemployed/not in workforce) fixed effects. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-24: Unfairness, importance of effort and political view by actual position and position misperception using restricted sample

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Panel A: No controls							
Position	-1.18***	-1.13***	-1.28***	-1.45***	-1.46***	0.82***	0.90***
	(0.07)	(0.07)	(0.07)	(0.08)	(0.09)	(0.07)	(0.07)
Misperception	-0.38***	-0.61***	-0.48***	-0.52***	-0.93***	0.44***	0.49***
	(0.10)	(0.09)	(0.09)	(0.10)	(0.11)	(0.10)	(0.10)
Panel B: With controls							
Position	-1.09***	-1.01***	-1.10***	-1.12***	-1.19***	0.92***	0.99***
	(0.09)	(0.08)	(0.09)	(0.09)	(0.10)	(0.09)	(0.08)
Misperception	-0.40***	-0.41***	-0.41***	-0.39***	-0.58***	0.47***	0.54***
	(0.10)	(0.10)	(0.09)	(0.10)	(0.11)	(0.10)	(0.10)
N	4692	4692	4600	3453	3218	4692	4692
Outcome mean	2.01	2.16	2.08	2.60	2.58	4.81	7.10
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)

Notes: In the table we only use the control group respondents and for each reference group, we only include respondents whose reported group matches the group reported in the register data. All outcomes are z-scores. *Position* denotes the actual position within reference group from percentile 1 to 100 divided by 100. Similarly, *Misperception* is the difference between perceived and actual position within the reference group divided by 100. *Controls* includes cohort fixed effects, an indicator for men, municipality fixed effects, educational level fixed effects and sector (incl. unemployed/not in workforce) fixed effects. *Outcome mean* is the mean of the non-standardized outcome variable. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-25: History of past social positions, unfairness, importance of effort and political view using restricted sample

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Position father	-0.059	-0.051	-0.070	-0.112**	-0.025	0.025	0.147***
	(0.037)	(0.037)	(0.037)	(0.042)	(0.044)	(0.037)	(0.035)
Position -20 yr.	-0.122**	-0.097*	-0.118**	-0.103*	-0.148**	0.061	0.263***
	(0.042)	(0.041)	(0.041)	(0.046)	(0.049)	(0.042)	(0.039)
Position -15 yr.	-0.203***	-0.169***	-0.147**	-0.143**	-0.081	0.131**	0.268***
	(0.048)	(0.048)	(0.048)	(0.053)	(0.058)	(0.049)	(0.046)
Position -10 yr.	-0.085	-0.100	-0.119*	-0.195**	-0.177*	0.206***	0.163**
	(0.058)	(0.057)	(0.058)	(0.066)	(0.071)	(0.058)	(0.055)
Position -5 yr.	-0.108	-0.096	-0.143*	-0.109	-0.205*	0.037	-0.015
	(0.070)	(0.068)	(0.069)	(0.078)	(0.086)	(0.070)	(0.066)
Position this yr.	-0.655***	-0.618***	-0.646***	-0.683***	-0.729***	0.540***	0.479***
	(0.074)	(0.073)	(0.073)	(0.085)	(0.094)	(0.074)	(0.070)
Observations	9046	9046	8878	6698	6164	9046	9046
Controls	✓	✓	✓	✓	✓	✓	✓

Notes: For each reference group, we only include respondents if the reported group matches the group observed in the register data. All outcomes are z-scores. *Position father* is the repondent's father's income rank when the respondent was 15 years old compared to other fathers of 15 year olds. All positions used as explaining variables have been re-scaled to go from 0.1 to 1. *Controls* includes a treatment indicator, cohort fixed effects, an indicator for men, municipality fixed effects, educational level fixed effects and sector (incl. unemployed/not in workforce) fixed effects. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE A-26: HISTORIC SHOCKS, UNFAIRNESS, IMPORTANCE OF EFFORT AND POLITICAL VIEW USING RESTRICTED SAMPLE

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Unemployment	0.20***	0.23***	0.21***	0.18**	0.24***	-0.11*	-0.061
	(0.051)	(0.050)	(0.051)	(0.059)	(0.069)	(0.052)	(0.049)
Observations	7537	7537	7397	5599	5498	7537	7537
Affected %	5.03	5.03	4.96	4.80	3.62	5.03	5.03
Disability	0.30*	0.54***	0.42**	0.36*		-0.31*	-0.25*
	(0.13)	(0.13)	(0.14)	(0.15)		(0.13)	(0.13)
Observations	9246	9246	9073	6841		9246	9246
Affected %	0.61	0.61	0.57	0.61		0.61	0.61
Hospitalization	0.093**	0.079**	0.091**	0.054	0.0084	-0.010	-0.018
	(0.029)	(0.028)	(0.029)	(0.033)	(0.034)	(0.029)	(0.028)
Observations	4749	4749	4662	3543	3257	4749	4749
Affected %	55.5	55.5	55.5	55.5	54.3	55.5	55.5
Promotion	-0.12**	-0.11**	-0.12**	-0.19***	-0.21***	0.14**	0.19***
	(0.045)	(0.044)	(0.045)	(0.051)	(0.054)	(0.045)	(0.043)
Observations	7970	7970	7832	5950	5622	7970	7970
Affected %	6.7	6.7	6.7	6.7	6.4	6.7	6.7
Pre-shock position FE	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓

Notes: For each reference group, we only include respondents if the reported group matches the group observed in the register data. All outcomes are z-scores. Each cell in the table is a separate regression of the column outcome on the row regressor and the controls indicated in the bottom part of the table. The explaining variables are all indicators that equal 1 if the respondent experienced the shock between 2012 and 2017. In each row, we exclude respondents who experienced the shock between 2008 and 2011. For *Unemployment*, we only use respondents who were in the workforce in the entire period. For *Disability*, we do not estimate the effect on fairness within sector, because very few disabled people work. *Controls* includes cohort fixed effects, an indicator for men, municipality fixed effects, educational level fixed effects and sector (incl. unemployed/not in workforce) fixed effects, all measured in 2008, and a treatment indicator. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A-27: Survey information experiment and unfairness, importance of effort and political view using actual reference groups

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Positive misperception	-0.132***	-0.131***	-0.131***	-0.140***	-0.249***	0.112**	0.117***
	(0.034)	(0.033)	(0.033)	(0.032)	(0.034)	(0.034)	(0.034)
T × Positive	0.154***	0.082*	0.097**	0.079*	0.087**	-0.010	-0.013
	(0.037)	(0.036)	(0.035)	(0.031)	(0.032)	(0.038)	(0.037)
T × Negative	0.023	0.022	0.030	0.033	0.013	0.006	-0.027
	(0.024)	(0.024)	(0.025)	(0.026)	(0.027)	(0.024)	(0.024)
N	9331	9331	9331	9331	8647	9331	9331
Position FE	✓	✓	✓	✓	✓	✓	✓

Notes: In the table, we use actual reference groups observed in the register data instead of reported reference groups. All outcomes are z-scores. *Positive misperception* is an indicator that equals 1 if the perceived position is larger than the actual position. $T \times$ *Positive* and $T \times$ *Negative* are interactions of the treatment indicator and the positive and 0 or negative misperception indicators. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

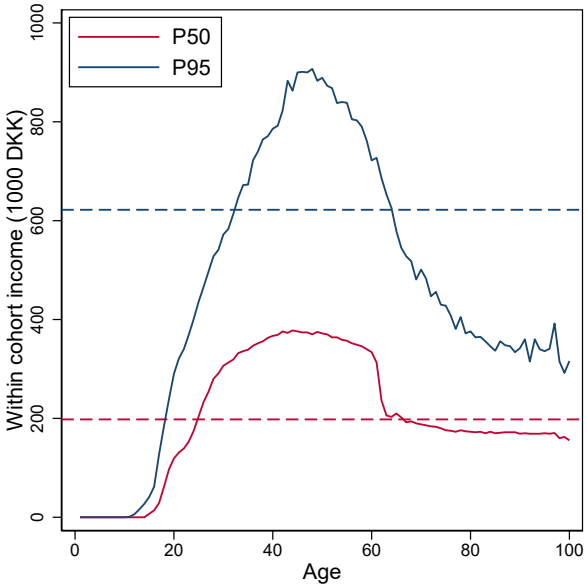
Table A-28: Survey information experiment and unfairness, importance of effort and political view using restricted sample

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Positive misperception	-0.132***	-0.131***	-0.131***	-0.168***	-0.277***	0.112**	0.117***
	(0.034)	(0.033)	(0.033)	(0.036)	(0.040)	(0.034)	(0.034)
T × Positive	0.154***	0.082*	0.100**	0.058	0.098**	-0.010	-0.013
	(0.037)	(0.036)	(0.035)	(0.034)	(0.038)	(0.038)	(0.037)
T × Negative	0.023	0.022	0.034	0.019	0.001	0.006	-0.027
	(0.024)	(0.024)	(0.025)	(0.031)	(0.033)	(0.024)	(0.024)
N	9331	9331	9156	6901	6356	9331	9331
Position FE	✓	✓	✓	✓	✓	✓	✓

Notes: For each reference group, we only use respondents if the reported group matches the group observed in the register data. All outcomes are z-scores. *Positive misperception* is an indicator that equals 1 if the perceived position is larger than the actual position. $T \times$ *Positive* and $T \times$ *Negative* are interactions of the treatment indicator and the positive and 0 or negative misperception indicators. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

F Moments in the Income Distribution

Figure A-25: Within cohort P50 and P95 by age



Notes: This figure shows the within cohort P50 and P95 income based on a 10% sample of the full population in Denmark. We use the same income definition as in the survey which excludes early retirement benefits, since the cohorts surveyed are not yet eligible for this benefit. The age cut-off for early retirement benefits is 60 and therefore we see a sharp drop at this age. We include pension payments, since we cannot disentangle old age pension and disability pension.

Table A-29: Moments in the full income distribution

	Income distribution percentiles				
	P5	P25	P50	P75	P95
Full population	0	57	198	358	622
Adult population	36	158	261	394	670
Working age population	39	217	333	447	751
45-50 year olds	112	262	373	502	896

Notes: This table shows different moments of the income distribution in 1,000 DKK based of different definitions of the population. The moments are based on a 10% sample of the full population in Denmark in 2017. *Adult population* are individuals from age 18 and up. *Working age population* are from age 25 to 65.

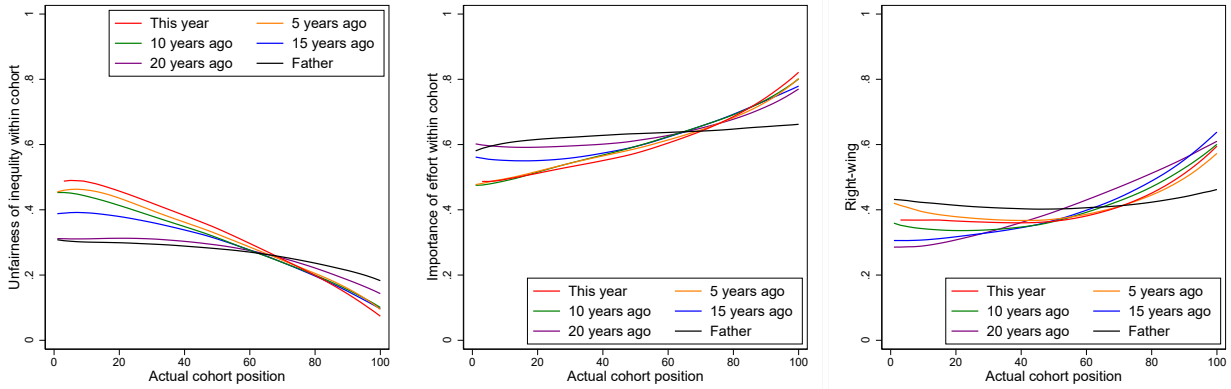
G Using Indicator Outcome Variables

Table A-30: Unfairness, importance of effort and political view by actual position and position misperception using indicator outcomes

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Panel A: No controls							
Position	-0.52***	-0.51***	-0.57***	-0.65***	-0.69***	0.45***	0.32***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)
Misperception	-0.18***	-0.25***	-0.22***	-0.20***	-0.42***	0.24***	0.18***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Panel B: With controls							
Position	-0.51***	-0.48***	-0.52***	-0.52***	-0.59***	0.45***	0.35***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Misperception	-0.19***	-0.18***	-0.19***	-0.16***	-0.30***	0.25***	0.19***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
N	4692	4692	4692	4692	4452	4692	4692
Outcome mean	.27	.30	.29	.40	.40	.63	.41
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

Notes: The sample is restricted to control group respondents. All outcomes are indicators that equal 1 if the outcome z-score is larger than 0. *Position* denotes the actual position within the reference group from percentile 1 to 100 divided by 100. Similarly, *Misperception* is the difference between perceived and actual position within the reference group divided by 100. *Controls* are cohort, municipality, education, gender, and sector fixed effects (including unemployed/not in workforce). *Outcome mean* is the mean of the indicator outcome variable. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

FIGURE A-26: HISTORY OF PAST SOCIAL POSITIONS, UNFAIRNESS, IMPORTANCE OF EFFORT, AND POLITICAL VIEWS USING INDICATOR OUTCOMES



Notes: Bandwidth for local linear polynomials is 20. For *Father*, the x-axis is the father's position among fathers when the respondent was 15 years old. All outcomes are indicators that equal 1 if the outcome z-score is larger than 0. Sample restricted to the control group.

Table A-31: History of past social positions, unfairness, importance of effort, and political view using indicator outcomes

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Position father	-0.023	-0.021	-0.028	-0.051**	-0.047**	0.021	0.060***
	(0.016)	(0.017)	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)
Position -20 yr.	-0.038*	-0.035	-0.028	-0.062**	-0.062**	0.027	0.132***
	(0.018)	(0.019)	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)
Position -15 yr.	-0.089***	-0.075***	-0.068**	-0.059**	-0.061**	0.064**	0.093***
	(0.021)	(0.022)	(0.022)	(0.023)	(0.023)	(0.023)	(0.023)
Position -10 yr.	-0.045	-0.054*	-0.072**	-0.080**	-0.088**	0.069*	0.075**
	(0.026)	(0.026)	(0.026)	(0.028)	(0.028)	(0.028)	(0.028)
Position -5 yr.	-0.035	-0.027	-0.038	-0.032	-0.036	0.056	-0.053
	(0.031)	(0.032)	(0.031)	(0.033)	(0.034)	(0.034)	(0.033)
Position this yr.	-0.311***	-0.314***	-0.322***	-0.356***	-0.397***	0.246***	0.202***
	(0.033)	(0.034)	(0.033)	(0.035)	(0.036)	(0.036)	(0.035)
Observations	9046	9046	9046	9046	8575	9046	9046
Controls	✓	✓	✓	✓	✓	✓	✓

Notes: All outcomes are indicators that equal 1 if the outcome z-score is larger than 0. *Position* denotes the cohort position from percentile 1 to 100 divided by 100. A coefficient of 1 means that going from the bottom of the distribution to the top increases the outcome by one standard deviation. *Importance of effort* is for income differences within cohort. *Position father* is the respondent's father's income rank when the respondent was 15 years old compared to other fathers of 15 year olds. *Controls* includes a treatment indicator, cohort, municipality, gender, education, and sector fixed effects (including unemployed/not in workforce). Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE A-32: HISTORIC SHOCKS, UNFAIRNESS, IMPORTANCE OF EFFORT AND POLITICAL VIEWS USING INDICATOR OUTCOMES

	Unfairness of inequality					Importance	Right-	N	Affected
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing		%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Unemployment	0.082***	0.093***	0.074**	0.073**	0.070**	-0.068**	-0.0048	7537	5.03
	(0.023)	(0.023)	(0.023)	(0.025)	(0.026)	(0.025)	(0.025)		
Disability	0.090	0.15*	0.17**	0.11		-0.16*	-0.049	9246	0.61
	(0.059)	(0.061)	(0.060)	(0.063)		(0.065)	(0.064)		
Hospitalization	0.036**	0.031*	0.033*	0.028*	0.017	-0.0080	-0.011	4749	55.5
	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)		
Promotion	-0.057**	-0.056**	-0.057**	-0.089***	-0.13***	0.072**	0.070**	7970	6.66
	(0.020)	(0.021)	(0.021)	(0.022)	(0.022)	(0.022)	(0.021)		
Pre-shock position FE	✓	✓	✓	✓	✓	✓	✓		
Controls	✓	✓	✓	✓	✓	✓	✓		

Notes: All outcomes are indicators that equal 1 if the outcome z-score is larger than 0. Each cell in the table is a separate regression of the column outcome on the row regressor and the controls indicated in the bottom part of the table. The explaining variables are all indicators that equal 1 if the respondent experienced the shock between 2012 and 2017. In each row, we exclude respondents who experienced the shock between 2008 and 2011. For *Unemployment*, we only use respondents who were in the workforce in the entire period. For *Disability*, we do not estimate the effect on fairness within sector, because very few disabled people work. *Controls* included in all regressions are cohort, gender, municipality, education and sector fixed effects (incl. unemployed/not in workforce), all measured in 2008, and a treatment indicator. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE A-33: SURVEY INFORMATION EXPERIMENT AND UNFAIRNESS, IMPORTANCE OF EFFORT AND POLITICAL VIEW USING INDICATOR OUTCOMES

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Positive misperception	-0.056***	-0.049**	-0.069***	-0.052***	-0.135***	0.051**	0.040*
	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)	(0.017)	(0.017)
T × Positive	0.061***	0.030	0.036*	0.027	0.039**	-0.001	-0.003
	(0.017)	(0.017)	(0.016)	(0.015)	(0.015)	(0.018)	(0.019)
T × Negative	0.001	0.010	0.001	0.035**	0.007	0.003	-0.001
	(0.011)	(0.011)	(0.011)	(0.013)	(0.013)	(0.012)	(0.012)
N	9331	9331	9331	9331	8854	9331	9331
Position FE	✓	✓	✓	✓	✓	✓	✓

Notes: All outcomes are indicators that equal 1 if the outcome z-score is larger than 0. *Positive misperception* is an indicator that equals 1 if the perceived position is larger than the actual position. $T \times$ *Positive* and $T \times$ *Negative* are interactions of the treatment indicator and the positive and 0 or negative misperception indicators. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

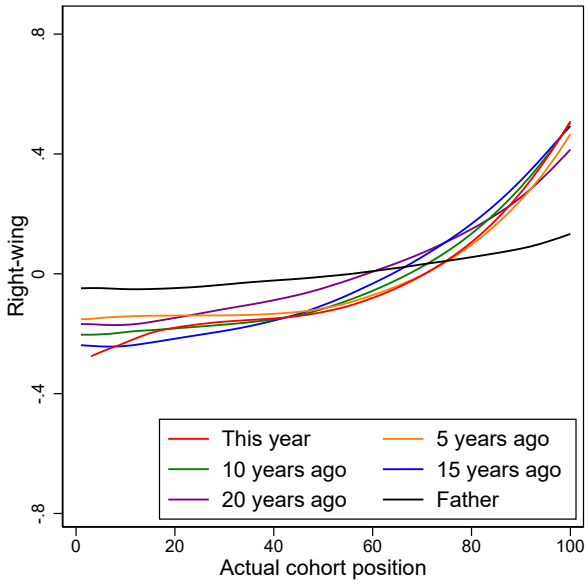
H Using Economic Policy View as the "Right-wing" Outcome

Table A-34: Unfairness, importance of effort and political view by actual position and position misperception using economic policy view as right-wing outcome

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Panel A: No controls							
Position	-1.18***	-1.13***	-1.27***	-1.36***	-1.42***	0.82***	0.91***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Misperception	-0.38***	-0.61***	-0.48***	-0.38***	-0.86***	0.44***	0.45***
	(0.10)	(0.09)	(0.09)	(0.08)	(0.09)	(0.10)	(0.10)
Panel B: With controls							
Position	-1.09***	-1.01***	-1.09***	-1.03***	-1.19***	0.92***	0.86***
	(0.09)	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)	(0.09)
Misperception	-0.40***	-0.41***	-0.42***	-0.30***	-0.61***	0.47***	0.43***
	(0.10)	(0.10)	(0.09)	(0.09)	(0.09)	(0.10)	(0.10)
N	4692	4692	4692	4692	4452	4692	4692
Outcome mean	2.01	2.16	2.09	2.54	2.53	4.81	3.01
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.01)

Notes: The sample is restricted to control group respondents. All outcomes are z-scores. *Position* denotes the actual position within the reference group from percentile 1 to 100 divided by 100. Similarly, *Misperception* is the difference between perceived and actual position within the reference group divided by 100. *Controls* are cohort, municipality, education, gender, and sector fixed effects (including unemployed/not in workforce). *Outcome mean* is the mean of the non-standardized outcome variable. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

FIGURE A-27: HISTORY OF PAST SOCIAL POSITIONS, UNFAIRNESS, IMPORTANCE OF EFFORT, AND POLITICAL VIEWS USING ECONOMIC POLICY VIEW AS RIGHT-WING OUTCOME



Notes: Bandwidth for local linear polynomials is 20. For *Father*, the x-axis is the father's position among fathers when the respondent was 15 years old. The outcomes is the standardized z-score of the economic policy view variable. Sample restricted to the control group.

Table A-35: History of past social positions, unfairness, importance of effort, and political view using economic policy view as right-wing outcome

	Unfairness of inequality					Importance	Right-
	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing
Position father	-0.059	-0.051	-0.068	-0.081*	-0.075*	0.025	0.122***
	(0.037)	(0.037)	(0.037)	(0.036)	(0.037)	(0.037)	(0.036)
Position -20 yr.	-0.122**	-0.097*	-0.108**	-0.113**	-0.131**	0.061	0.141***
	(0.042)	(0.041)	(0.041)	(0.040)	(0.041)	(0.042)	(0.041)
Position -15 yr.	-0.203***	-0.169***	-0.148**	-0.126**	-0.139**	0.131**	0.268***
	(0.048)	(0.048)	(0.048)	(0.047)	(0.048)	(0.049)	(0.047)
Position -10 yr.	-0.085	-0.100	-0.117*	-0.186***	-0.162**	0.206***	0.197***
	(0.058)	(0.057)	(0.057)	(0.056)	(0.057)	(0.058)	(0.057)
Position -5 yr.	-0.108	-0.096	-0.152*	-0.108	-0.130	0.037	-0.030
	(0.070)	(0.068)	(0.069)	(0.067)	(0.069)	(0.070)	(0.068)
Position this yr.	-0.655***	-0.618***	-0.647***	-0.678***	-0.761***	0.540***	0.358***
	(0.074)	(0.073)	(0.073)	(0.071)	(0.074)	(0.074)	(0.072)
Observations	9046	9046	9046	9046	8575	9046	9046
Controls	✓	✓	✓	✓	✓	✓	✓

Notes: All outcomes are z-scores. *Position* denotes the cohort position from percentile 1 to 100 divided by 100. *Position father* is the respondent's father's income rank when the respondent was 15 years old compared to other fathers of 15 year olds. *Controls* includes a treatment indicator, cohort, municipality, gender, education, and sector fixed effects (including unemployed/not in workforce). Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE A-36: HISTORIC SHOCKS, UNFAIRNESS, IMPORTANCE OF EFFORT AND POLITICAL VIEWS USING ECONOMIC POLICY VIEW AS RIGHT-WING OUTCOME

	Current	Unfairness of inequality					Importance	Right-	N	Affected
	position	Cohort	Gender	Mun.	Edu.	Sector	of effort	wing		%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Unemployment	-12.2***	0.20***	0.23***	0.21***	0.18***	0.20***	-0.11*	-0.049	7537	5.03
	(0.78)	(0.051)	(0.050)	(0.050)	(0.049)	(0.052)	(0.052)	(0.050)		
Disability	-21.9***	0.30*	0.54***	0.42**	0.27*		-0.31*	-0.26*	9246	0.61
	(2.31)	(0.13)	(0.13)	(0.13)	(0.13)		(0.13)	(0.13)		
Hospitalization	-1.83***	0.093**	0.079**	0.089**	0.060*	0.039	-0.010	-0.0082	4749	55.5
	(0.49)	(0.029)	(0.028)	(0.028)	(0.028)	(0.028)	(0.029)	(0.028)		
Promotion	8.51***	-0.12**	-0.11**	-0.12**	-0.17***	-0.21***	0.14**	0.17***	7970	6.66
	(0.74)	(0.045)	(0.044)	(0.045)	(0.044)	(0.044)	(0.045)	(0.044)		
Pre-shock position FE	✓	✓	✓	✓	✓	✓	✓	✓		
Controls	✓	✓	✓	✓	✓	✓	✓	✓		

Notes: All outcomes z-scores. Each cell in the table is a separate regression of the column outcome on the row regressor and the controls indicated in the bottom part of the table. The explaining variables are all indicators that equal 1 if the respondent experienced the shock between 2012 and 2017. In each row, we exclude respondents who experienced the shock between 2008 and 2011. For *Unemployment*, we only use respondents who were in the workforce in the entire period. For *Disability*, we do not estimate the effect on fairness within sector, because very few disabled people work. *Controls* included in all regressions are cohort, gender, municipality, education and sector fixed effects (incl. unemployed/not in workforce), all measured in 2008, and a treatment indicator. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.