Which income comparisons matter to people, and how? Evidence from a large field experiment

Xiaogeng Xu

Satu Metsälampi

Michael Kirchler

Kaisa Kotakorpi

Peter Hans Matthews

Topi Miettinen

HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI

HANKEN

A! Aalto University

Helsinki GSE Discussion Papers

Xiaogeng Xu, Satu Metsälampi, Michael Kirchler, Kaisa Kotakorpi, Peter Hans Matthews, Topi Miettinen:
Which income comparisons matter to people, and how? Evidence from a large field experiment

Which income comparisons matter to people, and how? Evidence from a large field experiment[*]

Xiaogeng Xu[†]   Satu Metsälampi[‡]   Michael Kirchler[§]

Kaisa Kotakorpi[¶]   Peter Hans Matthews[‖]   Topi Miettinen[**]

May 10, 2023

Abstract

Received wisdom holds that income rank matters for life satisfaction. In much of the literature, however, income comparisons are limited to the national population and evidence is correlational. In this paper, we investigate differences in the causal effects of rank information across reference groups. In a representative sample of mid-career Finns, we randomize individuals to receive personal rank information about educational, municipal, occupational, or age reference groups, and compare the effects, for a set of alternative welfare measures, to the standard national reference group and to a control group that receives no information. We also characterize the accuracy of rank beliefs across groups. Our data, which integrates experimental and register data, finds that rank information causes differences in satisfaction with disposable income, perceived fairness of own income, and wage satisfaction, but not life satisfaction. We also find substantial variation in the effects across reference groups, with those for the national reference group both weak and insignificant.

JEL Codes: D63, D8, D91, I31
Keywords: Relative position, individual welfare, fairness, comparison group, information provision

[†]Hanken School of Economics, and Helsinki GSE

[‡]University of Turku

[§]University of Innsbruck

[¶]Tampere University, and Finnish Centre of Excellence in Tax Systems Research

[‖]Middlebury College, Aalto School of Business, and Helsinki GSE

[**]Hanken School of Economics, and Helsinki GSE topi.miettinen@hanken.fi

1 Introduction

As Luttmer (2005) reminds us, the notion that relative position has an important influence on human behavior is as old as social science itself. More than two and a half centuries ago, for example, Adam Smith claimed, in his *Theory of Moral Sentiments*, that "to be observed, to be attended to, to be taken notice of with sympathy, an approbation, are all the advantages which we can propose to derive from riches. It is the vanity, not the ease, or the pleasure, which interests us" (Smith 1759, p. 112-113). Luttmer (2005, p. 963) also quotes John Stuart Mill, writing almost a century later than Smith, who asserted, even more succinctly, that "men do not desire to be richer, but richer than other men." Most would date the modern literature, reviewed in Clark and D'Ambrosio (2015), to the development of social comparison theory (Festinger, 1954) in psychology and the relative income hypothesis (Veblen, 1899; Duesenberry, 1949) in economics and sociology.[1] Recent influential work on inequity aversion and fairness (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Cappelen et al., 2007; Fehr and Schmidt, 2006) found much inspiration in these literatures, and has shaped how we understand departures from narrow self-interest in choice data.

Understanding which reference groups matter for people is crucial because it has been shown that the concern for relative position or income may have fundamental and far-reaching implications for human behavior: such concerns may induce people to take actions in pursuit of higher rank (Kuziemko et al., 2014; Martinangeli and Windsteiger, 2021), or higher relative payoff (Bellemare et al., 2008) even if such actions are against their own narrow material self-interest. Some earlier studies suggest that relative income or rank may matter even more for happiness and satisfaction than absolute income (Clark et al., 2008; Boyce et al., 2010).[2]

We therefore focus on the first and most fundamental questions, namely what are the reference groups that individuals compare themselves to? Do people compare themselves to compatriots, neighbors, colleagues, age cohort, or educational peers? And, as a consequence, on which comparisons should researchers and policy-makers focus in their pursuit to explain individual behavior better and to promote effective policies?

---

[1]For a comparison of Smith and Veblen on the pursuit of status, see Wisman (2019).

[2]See also Gill et al. (2019) who use a real-effort tournament and uncover evidence of both "first-place loving" and "last-place aversion" in effort levels, Kirchler et al. (2018) who find that finance professionals' risk taking is highly responsive to information about rank in an investment task in a large scale lab-in-the-field experiment, and Xie et al. (2017) who provide evidence for an aversion to "rank reversals."

Numerous studies have examined the effects of relative income or rank within one assumed reference group on happiness and satisfaction, including the nation as a whole, workplace, neighborhood, education or age groups (Card et al., 2012; Clark et al., 2009; Ferrer-i-Carbonell, Ada, 2005; Godechot and Senik, 2015; McBride, 2001; Easterlin, 1974; Alesina et al., 2004; Perez-Truglia, 2020). There are almost no studies, however, that have compared the strength of causal effects of relative income across reference groups.[3]

To study which reference groups matter most for satisfaction and fairness, we invited a representative sample of 20 000 mid-career Finns aged 35 to 45 to participate in a pre-registered information provision experiment.[4] We did so in cooperation with Statistics Finland and were later able to link our results with administrative data. We elicited incentivized beliefs about income rank in various reference groups, and then assigned participants at random to one of five information treatments. Each of these provided rank information in a particular reference group: based on the treatment, individuals learned about their rank in the distribution of disposable income for their occupation, age cohort, educational level, municipality, or the national distribution. In addition, there was a no-information control group. We report estimates of the causal effects of rank information on self-reported life, job, and wage satisfaction, satisfaction with disposable income, and fairness perception of own income.

As a major finding, we report significant causal effects of information about rank on satisfaction with disposable income, wage satisfaction, and perceived fairness of own income. We also find and rationalize much weaker and often non-existent effects on job and life satisfaction. Furthermore, the effects on satisfaction with disposable income are strong and highly significant for circumscribed groups—educational level, occupation, age cohort, and municipality—but small and insignificant for the national reference group. Educational group emerges as a particularly important reference group in which information about income rank has strong and statistically significant effects on all income-related well-being measures. We also contribute to the discussion on robustness of scientific findings by providing a multiverse analysis (Simonsohn et al., 2020), a method well-suited for experiments with large representative samples linked to administrative data that cannot be shared on open science platforms. This

---

[3]The recent work of Hvidberg et al. (2023) is an exception that comes closest to our study, and we discuss the crucial differences between the two papers at the end of this section. In descriptive research, Clark and Senik (2010) report that work colleagues are the most important reference group, at least for income comparisons, but the estimates are not causal.

[4]The pre-analysis plan can be found at https://doi.org/10.17605/OSF.IO/DJQ3G.

analysis shows that our key results are indeed very robust to different specifications.

In addition to our key aim of analyzing the strength of relative income concerns in different reference groups, our study also makes three additional contributions to the literature. First, it is common for researchers to limit attention to one or two measures of happiness or individual welfare, but these concepts should be understood as multi-dimensional, and it is not obvious which dimensions are most relevant in social comparisons. Easterlin's well-known "paradox of happiness" focuses on life satisfaction, for example, while Card et al. (2012) features job and wage satisfaction. If, as our own priors suggested, comparisons of private consumption are an important source of positional concerns (Veblen, 1899; Corneo and Jeanne, 1997; Frank, 1989; Layard, 2005, for instance), the relevant outcome would instead be satisfaction with *disposable* income. We also know, however, that a sense of fairness is integral to individual well-being, and that the voluminous literature on inequality aversion (Fehr and Schmidt, 2006) and fairness (Almås et al., 2020) predicts that information about relative income will also be a principal determinant of fairness perceptions. To this end, we consider not only the causal effects of information about rank in different reference populations in this paper, but the effects on different outcomes. While we will focus much of our attention on satisfaction with disposable income, we report results for four other measures of individual welfare. The outcomes are grouped into income and broader non-income related measures of satisfaction.

Second and relatedly, our work casts incidental doubt on the standard resolution of the Easterlin (1974) paradox, which asserts that the correlation between income and life satisfaction in the cross-section, but not over time, is best understood as a relationship between national rank, which is itself correlated with cross-sectional income, and life satisfaction. We show that while rank and life satisfaction are indeed correlated, there is no causal relationship: exogenous variation in beliefs about national rank have little or no effect on life satisfaction. Thus, our experimental data does not lend support for resolution of the Easterlin paradox which emphasizes the effect of relative income on life satisfaction in general. Yet, relative income does matter for satisfaction outcomes more narrowly related to money: satisfaction with disposable income and wage satisfaction but even those effects are weak and insignificant in the national reference group. It should be noted, however, that unlike Card et al. (2012) or Perez-Truglia (2020), our setting abstracts from the social image effects of income rank, in which interested individuals can discover another's rank.[5]

---

[5]We also note that in Finland, anyone can enter a tax office to request access to information

Third, our protocol offers another reminder that *experienced* or *believed* position is different than *actual* rank, and extends previous results on imperfect knowledge concerning rank (Karadja et al., 2017; Fehr et al., 2022; Hvidberg et al., 2023). In the process, we uncover some intriguing patterns in these misperceptions such as the prevalent underestimation of income rank, and the high correlation of biases in rank beliefs between some but not all reference groups. All these studies, including ours, use a variant of the information protocol summarized in Haaland et al. (2023) to study causal effects of rank or relative income information. Our focus is on satisfaction and fairness measures and the comparison of causal effects of such information across reference groups that are narrower than the national distribution that is the focus of much previous work.

In addition to the related work already cited, Lindqvist et al. (2020) study Swedish data on lottery winners and find substantial causal effects of increased absolute wealth on life satisfaction but much smaller effects on mental health and happiness. Naturally, changes in absolute income will also affect relative income, but their work does not distinguish those. Kuhn et al. (2011) estimate the causal effects of winning a lottery on consumption of neighbors, but do not distinguish between implied changes in relative income and information or expectations interactions due to social learning (Manski, 2000).

The study closest to ours, however, is Hvidberg et al. (2023), who use a similar information provision design, matched to Danish administrative data, to examine both the nature of (mis)perceptions across various income distributions and their effects on fairness perceptions about income distribution as a whole, as opposed to the fairness of one's own income. There are important differences between the two studies, however. First, our design allows to disentangle the causal effects of relative income information in different reference groups. This is achieved through random assignment of participants to treatments that involve information provision on rank in one, and only one, reference group. Any potential updating of beliefs about rank in other reference groups as a result, is (and should be) part of the effect that we estimate. Second, we consider a broader set of welfare and fairness measures. Therefore, our paper provides novel evidence on two understudied but central issues in the study of well-being: which types of income comparisons most matter to people, and how they matter. Further, there are some differences in our respective results, which we shall

---

about the taxable income of another taxpayer, but that information about income ranks in various distributions is not easily accessible.

discuss in more detail in subsequent sections, the most important of which concern the relative importance of local versus national rank and the consequences of rank within occupation.

The remainder of the paper continues as follows. Section 2 outlines our pre-registered design and its implementation, including data on balance, selection, and attrition. It also summarizes our primary, secondary, and exploratory hypotheses. Section 3 characterizes the data on misperceptions both within and across distributions. Section 4, the heart of the paper, both summarizes and dissects our main results. Section 5 confirms the robustness of the results on the basis of a specification curve analysis. Section 6 offers further thoughts on the results and their implications. Section 7 concludes.

2   Research Design

We conducted a pre-registered information provision experiment in cooperation with Statistics Finland (SF) in the summer of 2021 after conducting a pilot study with 2500 invitations in late 2020. We designed a personalized online survey containing incentivized belief elicitation and outcome measures, an information provision treatment, and standard survey questions (see Appendix E for English translations of the survey). We invited a representative sample of 35 to 45 year old Finns who had not permanently left the labor force at the time of the survey to participate.[6] The survey data is linked to SF's administrative records.

2.1   Survey outline

The survey consists of five sections: background, incentivized income rank belief elicitation, income rank information treatment, outcomes and summary. The survey is the same for all respondents except for the information provision treatment, which varies according to the treatment assignment.

---

[6]More precisely, we restrict the sample to people born between 1975 and 1985, who had a Finnish social security number in 2010 (to approximate having lived in Finland for at least 10 years) excluding residents of Åland Island, whose mother tongue is either Finnish or Swedish, who have non-missing income and occupational information (for 2018) and whose family status is not "child" in SF register data. SF oversampled participants with basic and upper secondary education to account for the expected unit non-response implied by the response rates in the pilot survey. We chose to focus to this target population as people in their mid-career have had a chance to establish themselves in the labor force and still have active years ahead so that information about relative income has a chance of affecting their career and other choices.

Respondents log in with a personal username and password provided in the survey invitation.[7] In the first part of the survey, participants answer questions about their birth year, gender, marital status, highest completed education, occupation, and municipality of residence.[8]

In the income rank belief elicitation section participants are asked to report their beliefs concerning their (disposable) income rank in 2018 among individuals in a given reference group.[9] The beliefs are elicited for each reference group in random order. To incentivize the assessment, we rewarded participants whose rank assessment for a reference group chosen at random was "correct." Following the method of belief elicitation of Schlag and van der Weele (2015), an answer was considered correct if it fell within the same 5-point interval (e.g., 0-5%, 6-10%, ..., 96-100%) as the exact rank.[10] The participants learn if they receive the bonus only at the end of the survey. We also clarify the definition of disposable income and remind the participants of the definition along the survey wherever there is a question regarding income.[11]

The third section of the survey is the information provision treatment. The participants are provided information concerning their (disposable) income rank among individuals in the reference group corresponding to the treatment they are randomly assigned to. This allows us to identify the causal effect of that piece of information alone. This does not of course mean that we would be able to rule out that receiving information on the rank in one reference group would lead the respondents to update their beliefs about their rank in the other reference groups. We discuss this in more

---

[7]Logging in with the username was necessary for the tailored information in the survey and helped prevent duplicate participation, see details in Appendix D.

[8]The last three questions concern their situation in 2018. The rank and reference group information used in the information provision treatments concern the year 2018, and the goal of these questions is to help the respondent to recall their situation in the relevant time period and allow us to determine whether self-reported reference groups match those in the administrative data used in constructing the treatment rank information.

[9]The respondents indicate the percentage of the population of each reference group who they believe had lower disposable income than their own (see Appendix E for screenshots of the survey in English).

[10]This method is simple to understand and robust to bias generated by risk-aversion, unlike some scoring rules widely used in the literature.

[11]We define disposable income by stating in the survey, "By income, we refer to the total after tax annual income, which contains income from labor and capital, as well as all transfers and subsidies like unemployment benefits and pensions (i.e., disposable income)." This differs from the definitions used in some existing studies: Karadja et al. (2017) use both labor and capital income before taxes, including pensions but exclusive of transfers such as unemployment insurance, Fehr et al. (2022) use household level income, and Hvidberg et al. (2023) focus on wage income alone. We use the *in-pocket-money* definition because it approximates well the standard of living and potential consumption, and is closely related to individual well-being.

6

detail in section 6.

Our seven treatments are summarized in Table 1. The participants in the CON-TROL group receive no information about their income rank. The participants in the five treatments with exogenously assigned information (AGE, MUNICIPALITY, EDU-CATION, OCCUPATION, NATIONAL) receive information about their income rank in the corresponding reference group. For instance, the participants in treatment ED-UCATION are informed of their income rank among all Finns with the same level of education as the participant (see Figure A1 for an example of the treatment information). In the endogenous information treatment CHOICE participants choose one of the five reference groups and later receive the chosen information; we postpone the examination of this treatment until future papers, consistent with our pre-analysis plan. The rank information is provided alongside the perceived rank which the participants reported in the previous section.[12] We also ask the participants to answer a question concerning the interpretation of the information to ensure that they understand the information correctly before proceeding.

Table 1. Treatments and reference groups

Treatment	Description
CONTROL	No information about income rank
AGE	Exogenous information: income rank among people born in the same year
MUNICIPALITY	Exogenous information: income rank among adults living in the same municipality
EDUCATION	Exogenous information: income rank among people with same level of education (Level of education defined as basic, upper secondary, bachelor, master or higher. Classification is based on ISCED 2011.)
OCCUPATION	Exogenous information: income rank among people with same occupation (Classification is based on classification of occupations 2010 on 2-digit level, which follows the structure of ISCO-08, e.g. "teaching professionals", "sales workers.")
NATIONAL	Exogenous information: income rank among adult Finns
CHOICE	Endogenous information: income rank among the chosen reference group

Notes: This table presents the treatments and reference groups used in the treatments. For a list of the occupational groups, see Table B7.

The outcome section of the survey consists of a series of standard survey questions concerning individual well-being and views toward societal and political issues, and a set of incentivized tasks. There are six blocks of questions: (i) individual well-

---

[12]We also clarify that the reference group for which the income rank information is provided is not necessarily the randomly chosen reference group that determines the bonus payoff.

being (fairness views of own income, feelings about income, life satisfaction, job/wage satisfaction, meaningfulness of job, and job search intentions); (ii) ideal income distribution, trust in institutions, and attitudes toward policies (tax, labor market, welfare, migration, and trade); (iii) just world beliefs; (iv) self-assessment and social preferences; (v) political orientations; and (vi) incentivized decision tasks. The order of the first three blocks and the order of the questions within each block is randomized (with some exceptions, see Appendix D for a full description of questions and question ordering principles).[13]

In this paper we focus on the impact of rank information on individual well-being (block (i)).[14] In this block, participants were asked to use sliders to report various measures of individual welfare, including satisfaction with disposable income, a featured outcome, from "disappointed" to "pleased," as well as fairness of disposable income ("unfairly low" to "fair" to "unfairly high"), life satisfaction ("extremely satisfied" to "extremely satisfied"), likelihood of job search in the next six months ("very unlikely" to "very likely"), wage and job satisfaction ("not at all satisfied" to "very satisfied") and then meaningfulness of job ("not at all meaningful" to "very meaningful").[15] With the exception of wage and job satisfaction, the order was randomized: we asked the former before the latter in order to encourage assessments of job satisfaction *net* of wage satisfaction.

2.2 Hypotheses

As is clear from our experimental design, our central focus is to shed light on the differences between, and relative importance of, income rank information effects across various reference groups. Careful studies have shown income comparisons to be rele-

---

[13]Because we can only ask the participants who are active in the labor market about their job and wage satisfaction, the questions related to one's job are asked after the participant has answered a question on their current employment status.

[14]This paper discusses the outcomes and treatments described as "Project 1" in the pre-analysis plan at https://doi.org/10.17605/OSF.IO/DJQ3G. Other outcomes and the endogenous information treatment CHOICE will comprise subsequent projects.

[15]To prevent a priming effect, there is no default position of any slider in the survey, see Appendix E. When answering with any slider, the participants need to tap on the slider and a thumb shows up. We use visual analogue scale (VAS) in all survey (outcome) items discussed in this paper except for job search intentions which requires a categorical answer. The analogue ratings not only give greater resolution of scale and can be considered continuous, but helps mitigate the concern for discrete likert scale. Bond and Lang (2019) show that if we let people answer about their happiness by choosing from a few discrete categories without knowing the underlying distribution, we cannot easily compare the average level of happiness between groups. While Kaiser and Oswald (2022) release the concern by showing the linear relationship between happiness and behavior, the concern may apply to the measurement of some outcomes other than happiness such as fairness.

vant in various reference groups (Ferrer-i-Carbonell, Ada, 2005; Luttmer, 2005; Clark et al., 2009; Clark and Senik, 2010; Card et al., 2012; Clark and D'Ambrosio, 2015; Godechot and Senik, 2015; Cullen and Perez-Truglia, 2022; Hvidberg et al., 2023), but we know of no other studies that systematically compare causal effects of information provided for one randomly assigned reference group at a time.

We set out to study whether a smaller geographical unit (municipality), or occupational, educational, or age cohort comparisons lead to stronger or qualitatively different effects than the widely studied national reference group. These comparisons are not pre-registered as we did not have strong priors regarding the reference group differences.

To summarize, we have three outcomes that measure a dimension of satisfaction with own income ("fairness of income", "satisfaction with disposable income" and "wage satisfaction") and three that concern non-monetary dimensions of well-being ("life satisfaction", "job satisfaction", "job meaningfulness"). We hypothesize the following concerning these different dimensions of individual well-being:

Effects on income related well-being measures (Primary hypotheses)

Hypothesis 1a. *Relative income information affects satisfaction with disposable income.*

Hypothesis 1b. *Relative income information affects perceived fairness of own income.*

Hypothesis 1c. *Relative income information affects wage satisfaction.*

Effects on non-income related well-being measures (Secondary hypotheses)

Hypothesis 2a. *Relative income information has negligible effects on life satisfaction.*

Hypothesis 2b. *Relative income information has negligible effects on job satisfaction.*

In addition to the above mentioned hypotheses, we explore the effects of relative income information on perceived meaningfulness of job and the symmetry of the effects between the positively and negatively surprised participants.[16]

---

[16]In the appendix, we will also report the effects of relative income information on job search intentions (exploratory) as stated in the PAP, but limit the discussion of the results to section 6.

2.3 Survey implementation

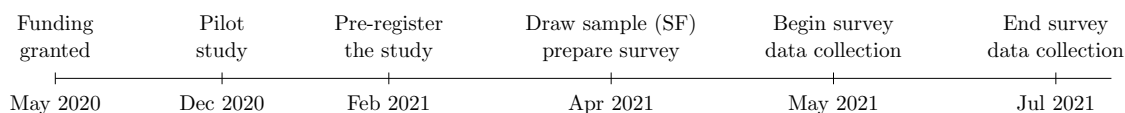| Funding granted	Pilot study	Pre-register the study	Draw sample (SF) prepare survey	Begin survey data collection	End survey data collection
May 2020	Dec 2020	Feb 2021	Apr 2021	May 2021	Jul 2021

Figure 1. Timeline of the study

The online survey was developed with oTree software (Chen et al., 2016) and hosted on the server of Hanken School of Economics, Helsinki, Finland. The survey was personalized and contained embedded information concerning the respondents. The information, provided by SF, included the respondent's occupational group, disposable income rank in the five reference groups, as well as the treatment to which the respondent was randomly assigned to.[17]

The study was pre-registered before data collection started.[18] Data collection took place in the Summer of 2021 (see Figure 1 for the timeline of the study). The invitation letters were sent to 20,000 individuals by SF via mail, accompanied with email and text message reminders.[19] Participants received 15 euro for completing the survey and an additional 5 euro depending on their response in the incentivized belief elicitation task. The participation payments were sent as giftcards via text message or mail by SF. Participants could also use (some or all of) their payment as a donation to a charity (Save the Children), as a voluntary tax, or choose to receive a corresponding amount of lottery tickets. One of these three outcomes/purposes was randomly drawn for each participant at the end of the survey and the amount spent was subtracted from the amount sent as a giftcard. The lottery tickets were sent via mail by SF, and the donations to charity and voluntary taxes were handled by Hanken School of Economics. The receipts of total sums of donations were posted online and messaged to the participants after data collection ended.

---

[17]The randomization was done by SF. The invitees were assigned into treatments according to 36 strata based on the following characteristics: gender (male, female), income (three classes by percentiles with cutoffs at 33.3% and 66.6%), statistical grouping of municipalities (urban municipalities, semi-urban municipalities, rural municipalities) and educational degree (basic education, other).

[18]The pre-registration can be found at https://doi.org/10.17605/OSF.IO/DJQ3G.

[19]The letter included a general description of the study and how the survey data is used, link to a data protection description, link to the survey (URL and QR code), and a personal username and password.

2.4 Sample and data

Table B3 presents summary statistics for the respondents who entered the survey (column 1), respondents who completed the survey (column 2) and sampling frame population (column 3). The sampling frame population refers to the population from which the sample was drawn. The survey sample includes all participants who entered the survey. The sample is representative in terms of gender, age, mother tongue, family structure and income. The share of respondents with basic level of education is lower than in the sampling frame population, as is the share of self-employed individuals. Respondents are somewhat more likely to reside in an urban area.

6642 of the 20 000 invitees (33%) started completing the survey and 92% of them finished. All observations from treatments AGE, MUNICIPALITY, EDUCATION, OCCUPATION, NATIONAL and CONTROL, (also incomplete answers), are included in our main sample of analysis (see Section 5 for results with different sample restriction criteria).[20] The number of invitees and the response and completion rates by treatment are reported in Table B1. Table B5 shows the relation between the overall and post-treatment attrition and background characteristics of the respondents. Women, and also respondents assigned to the treatment MUNICIPALITY tend to drop out more often, but there are no significant differences in attrition between treatments at any time after the participants have received the rank information treatments. Finally, Table B4 presents the summary statistics of socio-economic variables in the five treatments against the CONTROL treatment. None of the differences are significant at the 5% level.

The analyses in this paper use survey data and register data. The outcome, treatment and control variables used in the main specification are described in Table B8. Table B6 compares self-reported information to register data (when applicable).

3 Misperceptions about income rank

In this section, we describe the misperceptions regarding relative income rank in the various reference groups we study. As our treatments rely on an information provision design summarized in Haaland et al. (2023), these misperceptions play a key role in

---

[20]Alternative data restrictions, including restricting the sample to only respondents who completed the survey, are applied in the robustness checks (see Section 5).

the identification of our main causal effects in Section 4.[21]

Figure A3 contrasts the distributions of actual and perceived income ranks in reference groups *education* (panel a), *occupation* (panel b), *municipality* (panel c), *age* (panel d) and *national* (panel e). Figure A4 displays respondents' misperceptions concerning their rank, defined as prior belief minus actual rank, in a given reference group. Most respondents report a position that is lower than their actual rank; 90% underestimate their position in the national and municipality's income distributions, 80% in Education, 75% in Age and 70% in Occupation.[22] Systematic underestimation of own position in the national income distribution is in line with Karadja et al. (2017) who show that 86% of a representative sample of Swedes underestimate their position in Sweden's national income distribution. (It is worth noting that our results are similar despite the quite different income profiles of our respective samples.) By contrast, Cruces et al. (2013), Fernández-Albertos and Kuo (2018), and Engelhardt and Wagener (2018), Fehr et al. (2022) and Hvidberg et al. (2023) find more balanced misperceptions among Argentinians, Spaniards, Germans and Danes, respectively. In a survey experiment across Australia, India, Mexico, Morocco, Netherlands, Nigeria, South Africa, Spain, United Kingdom and United States, Hoy and Mager (2021) find that respondents are not able to place themselves in the correct quintile in the national distribution of household incomes and that respondents in high income countries have more accurate beliefs.

Misperceptions are significantly correlated and correlation is strongest between National and Municipality income distributions ($\rho = 0.79$, $p < 0.001$, see panel c in Figure A2).[23] Visual comparison of misperceptions for reference group National vs. other reference groups is suggestive of this, too (see Figure A5). Misperceptions about rank in the national distribution are largest: Respondents underestimate their position by 22 percentage points on average (see Table B9). The smallest average misperception concerns position in the age group's distribution. This is close to what Hvidberg et al. (2023) find among Danish respondents, but unlike them we find that respondents in our sample hold on average almost as inaccurate beliefs about their

---

[21]In the pre-analysis plan we state that we analyze and compare the individual distributions of misperceptions and examine whether, consistent with previous studies, education, age, income and gender are significant predictors of misperceptions about rank in the national distribution, and whether this is true for the other distributions.

[22]This is consistent with what we hypothesize in the pre-analysis plan concerning the nature of misperceptions.

[23]The correlations of misperceptions partly reflect correlations among actual ranks, which are significant and substantial (see panel a in Figure A2, and panel b in Figure A2 for correlations between beliefs).

position in their municipality distribution as the national one (see Figure A5 for a comparison of misperceptions about own position in the national and other income distributions). While there are significant differences in average misperceptions across reference groups in our study sample, the magnitudes of mean absolute misperceptions are quite similar for all reference groups.[24]

Misperceptions about own relative income may arise because people interact more often with people of similar income level, leading individuals with income below the median to overestimate their position and above the median to underestimate it (see e.g. Fehr et al. (2022) and Cruces et al. (2013) for evidence of this tendency). Figure A6 plots actual income positions against misperceptions in different reference groups. The association between misperception and position among individuals with the same occupational group (panel b) is suggestive of this, but our sample (Finns aged 35 to 45 who are not permanently out of the labor force) is such that the majority of individuals have incomes above the median, making it impossible to assess the possible role of middle-class bias.

Table 2 regresses absolute misperceptions on individual characteristics. The determinants of misperceptions are similar in all reference groups, consistent with strong correlations between misperceptions (panel c in Figure A2). In line with the results reported in Hvidberg et al. (2023), women tend to hold more inaccurate views than men. Having children is associated with less accurate perceptions, whereas living with a spouse is associated with more accurate perceptions. Highly educated individuals hold more accurate beliefs about own income position.

---

[24]Paired t-tests of difference in means indicate that the misperceptions differ between reference groups; (p-value < 0.001) for all pairwise comparisons, except All Finland vs. Municipality (p-value = 0.346), and Occupation vs. Age (p-value = 0.203).

Table 2. Determinants of misperceptions

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Female	0.028***	0.043***	0.029***	0.040***	0.038***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)
Spouse	-0.021***	-0.028***	-0.042***	-0.039***	-0.030***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)
Child(ren)	0.024***	0.024***	0.036***	0.040***	0.027***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
High education	-0.031***	-0.052***	-0.117***	-0.054***	-0.056***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)
Metropolitan area	0.013**	-0.045***	-0.004	0.005	-0.016***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
Disposable income (log)	0.046***	0.007	0.040***	0.054***	0.013
	(0.008)	(0.007)	(0.007)	(0.008)	(0.007)
Constant	-0.303***	0.179*	-0.151*	-0.328***	0.103
	(0.080)	(0.075)	(0.073)	(0.081)	(0.076)
Mean (abs.) misperception	0.184	0.240	0.245	0.233	0.239
Standard deviation	(0.147)	(0.161)	(0.178)	(0.182)	(0.156)
R^2	0.030	0.059	0.083	0.040	0.044
Observations	6337	6337	6337	6337	6337

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses. Dependent variable is absolute misperception, defined as abs(belief - actual rank)/100 in each reference group. All independent variables are binary indicator variables except for Disposable income (log). Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area use SF's administrative data. The regressions use the full survey sample.

4 Causal effects of relative income information

4.1 Econometric specification

We adopt the following econometric framework to evaluate the effects of relative income information:[25]

$$Y_i^k = \beta_0 + \beta_1(ER_i^j - R_i^j) + \beta_2 T_i^j + \beta_3 T_i^j \cdot (ER_i^j - R_i^j) + \gamma \mathbf{X_i} + u_i. \qquad (1)$$

Here Y_i is the value of outcome k for individual i, R_i^j is i's actual rank in distribution j, ER_i^j is the same individual's belief about her rank in j, so that $ER_i^j - R_i^j$ is her misperception about rank, T_i^j is a treatment indicator that is equal to 1 if i is shown her actual rank in distribution j, and 0 otherwise, and $\mathbf{X_i}$ is a vector of control variables. Our outcome variables relate to one's satisfaction with income and to general satisfaction (not necessarily related to income). Equation (1) is our pre-registered main specification, but we also carry out a multiverse analysis as exploratory analysis—i.e., the specification curve analysis of Simonsohn et al. (2020)—in the following section, where we confirm the robustness of our findings to different specifications and sets of control variables.

The model is estimated over five subsample(s) that each include the control group and one of our treatment groups. The main coefficient of interest is β_3, which measures the causal effect of information about rank on the relevant outcome. For instance, β_3 reflects how the rank information changes the association with misperception of an outcome compared to β_1, the association in treatment CONTROL where the rank information is absent. On the other hand, β_2 provides an estimate of the treatment effect for those whose initial misperception is zero, and hence we expect β_2 to be zero: Information about rank should not matter for those people who have correct information in the first place.[26] Nevertheless, for econometric reasons we prefer to include T_i^j in the specification, and testing for $\beta_2 = 0$ serves as a test for the internal validity of our design. We also expect the coefficient β_3 to be of a sign opposite to β_1. This would indicate that our treatment truly provides meaningful information that undermines the relation between an outcome and misperception, thus causes changes in an outcome given the individuals' misperceptions.

---

[25]The design is similar to a few recent information provision experiments summarized in Haaland et al. (2023), see Hvidberg et al. (2023) and Fehr et al. (2022), for instance.

[26]We state in the PAP that we test the following secondary hypothesis in all papers related to the project: If there is no "surprise" embodied in the information provided, there is no per se treatment effect.

4.2 Effects of relative income information on different well-being measures

We begin with visually illustrating the effects of income rank information on the well-being outcomes in Figure 2 and Figure 3.

The diagrams show the estimation results for the β_3-coefficients of a discretized (not pre-registered) version of Equation (1), where the continuous misperception measures are replaced by dummies for belonging to a bin with negative surprise (i.e., positive misperception), (approximately) correct belief, and positive surprise.[27] Panel (a) in Figure 2, for example, shows the estimated difference in satisfaction with income for those who were and were not told their rank, for those who were negatively surprised (if receiving information), approximately correct, or positively surprised by their income rank in the five reference groups.

The first and most important finding from Figure 2 is the existence of a significant "misperception gradient" for almost all reference groups: the respondents who experienced a positive (negative) surprise about their rank were more (less) pleased with their disposable income, perceived more (less) fairness about their disposable income, and were more (less) satisfied with their wage.

In short, there is causal evidence that rank—or rather, information about rank—matters for well-being, thereby providing support for our first primary hypothesis 1a – 1c.

In contrast to Figure 2, the diagrams in Figure 3 display no obvious "misperception gradient" in any of the reference groups. This indicates that the information about relative position has little effect on the dimensions of well-being that are not directly related to income. We interpret this as evidence in favor of hypotheses 2a and 2b: the enjoyment a worker derives from her job, as opposed to the compensation for that job, ought not depend on relative income rank (panels (a), (b) and (c) of Figure 3).

---

[27]For example, the specification for the positive surprise is

$$Y_i^k = \beta_0 + \beta_1 \mathbb{1}\{ER_i^j - R_i^j < -10\,pp\} + \beta_3 T_i^j \cdot \mathbb{1}\{ER_i^j - R_i^j < -10\,pp\} + u_i,$$

where $\mathbb{1}\{ER_i^j - R_i^j < -10\,pp\}$ is the indicator for the believed income rank being more than 10 percentage points lower than the actual rank. The estimate of the coefficient β_3, as plotted in Figures 2 and 3, provides the raw average difference of the outcome between the treatment and control group in the three bins. In such specifications, the treatment dummy has to be subsumed as it is (almost) fully collinear with the dummy for (approximately) correct belief.
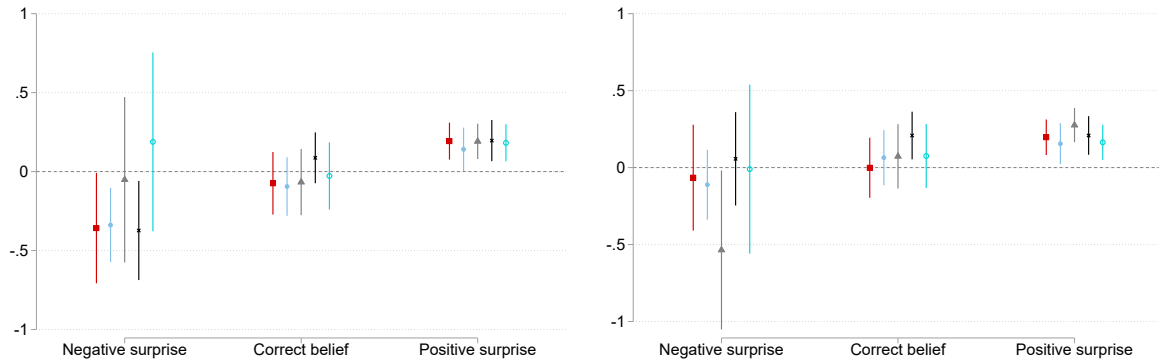
(a) Satisfaction with own disposable income   (b) Fairness of own disposable income
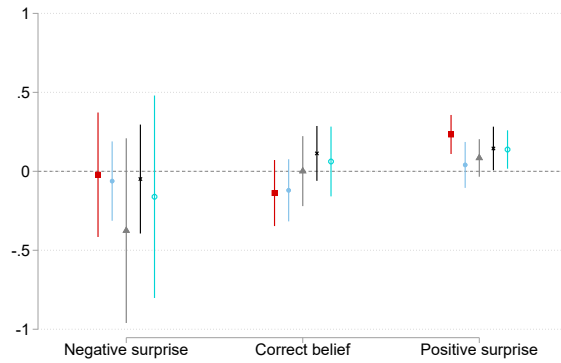
(c) Wage satisfaction

■ Education   ● Occupation   ▲ Municipality   × Age   ○ National

Figure 2. Income related effects

Notes: Each bar plots the difference (95% confidence interval) of satisfaction with disposable income (panel a), perceived fairness of income (panel b) and wage satisfaction (panel c) between the respondents who see their position in the corresponding reference group and the respondents in the control group who do not see their position. The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. "Negative surprise" refers to those who overestimate their income rank by more than 10 percentage points, "positive surprise" to those who underestimate their rank by more than 10 percentage points and "correct belief" to those whose assessment of their position is less than or equal to 10 percentage points in absolute terms.

(a) Life satisfaction

(b) Job satisfaction

(c) Job meaningfulness

■ Education   • Occupation   ▲ Municipality   × Age   ○ National
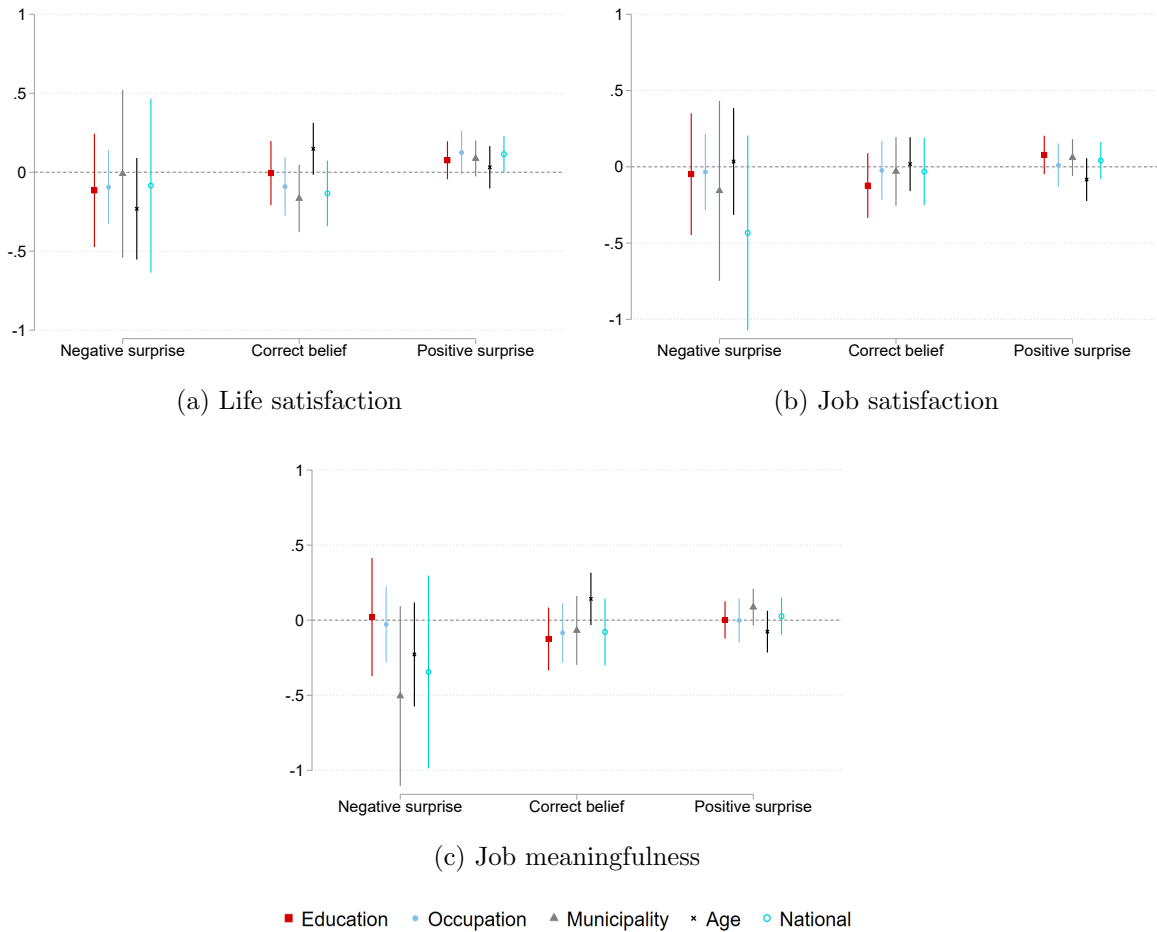
Figure 3. Non-income related effects

Notes: Each bar plots the difference (95% confidence interval) of life satisfaction (panel a), job satisfaction (panel b), and perceived meaningfulness of job (panel c) between the respondents who see their position in the corresponding reference group and the respondents in the control group who do not see their position. The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. "Negative surprise" refers to those who overestimate their income rank by more than 10 percentage points, "positive surprise" to those who underestimate their rank by more than 10 percentage points and "correct belief" to those whose assessment of their position is less than or equal to 10 percentage points in absolute terms.

The effects of relative income information on income satisfaction in panel (a) of Figure 2 are confirmed by the estimation results shown in Table 3, corresponding to the specification in Equation (1) thereby providing support for the primary Hypothesis 1a. As shown in the first column of Table 3, for example, receiving information about rank in the age cohort affects income satisfaction in the predicted direction. The estimate of β_3 implies that when a respondent believes her income rank among

people of her age is 10 percentage points lower than her actual position, informing her about the actual position would increase her income satisfaction by 0.07 standard deviations $(\hat{\beta}_2 + (-0.1) * \hat{\beta}_3)$.[28]

The effects of the income rank information on satisfaction with income at the mean misperceptions are shown as average treatment effects (the ATEs in Table 3). Also the ATEs confirm what we have seen from Figure 2: income satisfaction increases (decreases) when people learn that their actual position is higher (lower) than believed.

Note that the estimated coefficients of Treatment×Misperception (β_3) in Table 3 are all negative and significant except in the treatment NATIONAL. Note also that the estimated coefficient of β_3 is opposite in sign, and in some cases of similar magnitude, to the estimated coefficient of Misperception (β_1) on the respondent's baseline misperception. This indicates that our treatment does provide information that undermines, or even reverses, the initial positive relation between income satisfaction and the misperceptions about income rank, thereby leading to a change in income satisfaction given a misperception about rank.

Importantly, Figure 2 and the results in Table 3 also allow us to test the hypothesis that information provision should not matter to those who have the information in the first place. This is confirmed by the figure and the estimation results. Across all reference groups, among the respondents whose initial beliefs were correct, the differences between those who learn their actual position and those who do not, is close to zero. The estimated coefficient of (non-interacted) Treatment (β_2) is not statistically significant, thus giving support to our secondary internal validity hypothesis (see section 4.1).[29]

With few exceptions, Figure 2 provides scant evidence that the responses to positive and negative surprises are asymmetric. This result is found at odds with some previous studies (Di Tella et al., 2010). Table B23 in the Appendix shows estimation results for a specification that allows us to directly test for the presence of asymmetric effects: the gradient between income satisfaction and the misperception differs

---

[28]The misperception is defined as the difference between belief and actual position. The value in percentage points is divided by 100 to harmonize the range of mispercpetion and that of the well-being measures (standardized z-score). A misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position.

[29]For the other well-being measures, there are two instances where we observe a pure treatment effect: the effect of income rank in the age cohort on the perception of fairness of own disposable income (significant at 1% level, see Table 4), and the effect of national income rank on wage satisfaction (significant at 5% level, see Table 5).

between positively and negatively surprised respondents. The results show that the gradient is smaller for the negatively surprised than the positively surprised for most treatments except the treatment NATIONAL, although the results do not allow us to statistically reject the symmetry of the effect except in a few cases.[30]

Turning to the results on the other well-being measures, our outcome variables can be grouped into those that relate to one's satisfaction with income and those relating to general satisfaction (not necessarily related to income). Being satisfied with one's disposable income, discussed above, belongs to the first category. Other outcome measures in this group relate to fairness of own income, and wage satisfaction. Results related to these alternative measures are reported in Table 4 and 5. Both the graphical evidence and the estimation results are qualitatively similar to the results reported for satisfaction with disposable income, and hence provide support for the above findings.

Prompted by the influential theoretical contributions of Fehr and Schmidt (1999) and others on relative income concerns, we depart, for a moment, from our focus on primary pre-registered hypotheses to report some exploratory work on whether inequity concerns are more acute for those who earn less. Indeed, it was this possibility that motivated our original choice of the bipolar slider scale. With this in mind, we split the data into two subsamples: those who think their disposable income is unfairly low and those who think it is unfairly high (see Table B12 and B13). As it turns out, however, the effects for the two sub-samples are similar to those found for the sample as a whole. The implications for the inequity aversion literature are not clear, however: our focus is on rank and not relative income.

Let us next turn to measures of overall well-being, not necessarily related to one's income. General life satisfaction is probably the most commonly used well-being measure in the relevant literature. We find that by and large relative income information has no effect on life satisfaction, as stated in Hypothesis 2a.[31] This is also evident from Figure 3, which shows essentially no "misperception gradient" for life satisfaction. The estimates reported in Table 6 also show that the estimated coefficients of Treatment×Misperception (β_3) for life satisfaction are clearly smaller than for satisfaction with one's income, and mostly statistically insignificant. Results for job satisfaction and job meaningfulness are qualitatively similar to those for life satisfaction (see Figure 3 and Table B17 and B19 in the Appendix).

---

[30]See Tables B23 to B29 for the results of a linear spline specification.

[31]One exception is that β_3 in treatment OCCUPATION is statistically significant. The magnitude is not as large as the effect size for the income-related outcomes. The ATE's also show no significant effect of the income rank on life satisfaction in treatment OCCUPATION.

4.3 Effects of relative income information in different reference groups

Our experimental design allows us to examine whether individual well-being is affected by the knowledge about their place in the national income distribution, or other circumscribed comparison groups. We do not have pre-registered hypotheses on the treatment comparison. However, the differences are of key interest, as evidence on the causal effects of rank information in different reference groups is lacking to date. Our design provides exogenous variation in the reference group information, i.e., each respondent is randomly assigned to receive information on their rank in one reference group only. This allows us to identify the well-being effect of information about rank in each reference group separately.

Looking at the effects of rank information on satisfaction with disposable income (Table 3), rank in the national income distribution seems to matter less to people than rank in the other reference groups: the estimated effect of rank in the national income distribution (the coefficient of Treatment×Misperception, β_3, in the last column) is an order of magnitude smaller than in the other reference groups, and not statistically distinguishable from zero. Other income-related satisfaction measures provide qualitatively similar evidence, as the rank in the national income distribution consistently shows a statistically insignificant effect on well-being (see Figure 4). Table B32 provides results on formal tests of whether information on rank in different reference groups affects well-being differently.[32] We compare the treatment effects across the different reference groups by testing the equality of the β_3-coefficients in regressions run separately for each reference group (our baseline results, reported in Table 3, 4, and 5).[33] The last column of Table B32 shows the results of a joint test of whether the effects of relative income information are the same in all reference groups. The other columns provide pairwise tests across the different reference groups. We focus on the test of joint equality in the last column since we are interested mostly in whether the income rank information of different reference groups affects well-being in the same way or not.

---

[32]We discuss the treatment effect comparison in detail only in the context of the income-related satisfaction measures, where we find clear effects overall. For the measures related to general satisfaction, we did not find significant effects overall and we also find no differences between the reference groups.

[33]An alternative would be to run regressions with interactions between β_3 and the different treatments. However, this becomes problematic as we would need to control for all the different misperceptions, measured for all different reference groups, simultaneously in one regression. Given that the misperceptions in different reference groups are highly collinear, such an analysis is not feasible. Hence we opt for separate regressions per treatment.

The results in Table B32 suggest that the treatment effects are not equal between the reference groups. The p-value of the test against joint equality (β_3-coefficients equal across the five regressions) is 0.12 for fairness of own income, 0.07 for satisfaction with disposable income, and 0.03 for wage satisfaction. The pairwise comparisons indicate that the differences are driven by the effects for the reference group "national" being different from (smaller than) the more narrowly defined reference groups.[34]

Taken together, the results in the previous and current subsection show that income comparisons matter for people in many ways: receiving information about the relative position affects one's satisfaction with income, measured in different ways. The surprise, and a challenge to the standard explanation of the Easterlin paradox, is that overall life satisfaction is however quite insensitive to information about rank. We discuss this in more detail in Section 6, but we conjecture that life satisfaction is both multi-dimensional and long term; and it is in fact natural that relative position of income affects the income-related aspects of satisfaction more than other aspects. A related key finding is that what appears to matter most to people is not their position in the national income distribution—as is often assumed in the relevant literature, including that on the Easterlin paradox—but rather one's position in more finely defined reference groups.

4.4 Additional exploratory results

With the exception of gender, all of the fixed effects reported in the tables—high education, living with spouse, living in metropolitan area—are significant and same-signed across all welfare measures. Apart from metropolitan residence, all are also consistent with intuition and the prior literature. In their review of urban-rural happiness differentials across 150 countries, Burger et al. (2020) conclude that while urban dwellers report higher levels of happiness than their rural counterparts in much of the world, the opposite is true in many developed Western economies, especially northern and western Europe. This is not what we find, however: with the exception of the national distribution condition, respondents in the capital region reported significantly higher levels of life satisfaction, for example, ranging from 0.15 ($p = 0.004$) to 0.17 ($p = 0.002$) standard deviations (see Table 6).

---

[34]We also run tests to check the equality of the slope of misperception across the five *treated* groups in Table B33 ($\beta_1 + \beta_3$ of Equation (1)). The results are similar to what we find from comparing the β_3-coefficient: the joint equality of the slope of misperception in the five treated groups is rejected for the income-related well-being outcomes. The pairwise tests clearly show that the effect of income rank in the "national" distribution is smaller than the other reference groups.

Turning to gender, it is striking how much less satisfied women were with their disposable incomes, and how much more likely they were to perceive those incomes as unfair, controlling for other demographic characteristics. For example, the estimated effects on fairness perceptions range from 0.19 to 0.31 standard deviations, with all effects significant at the 0.1 percent level or better.

The dissatisfaction is not general, however: being female is a positive, if usually insignificant, predictor of both job and life satisfaction. The former is a stylized feature of the happiness literature (Clark, 2018) and is consistent with previous work on Finnish labor markets (Johansson, 2004). It is not clear, however, whether our data are consistent with the now conventional explanation, first proposed in Clark (1997), which highlights gender differences in expectations, since there is no spillover to satisfaction with individual wages nor disposable income.

Table 3. OLS results for the effect of income rank information on satisfaction with own disposable income

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.051	0.675***	0.583***	0.223	0.495*
	(0.189)	(0.200)	(0.164)	(0.138)	(0.202)
Treatment	-0.003	-0.041	-0.108	-0.083	0.120
	(0.057)	(0.075)	(0.064)	(0.054)	(0.080)
Treatment × Misperception	-0.768**	-0.735**	-0.871***	-0.594**	-0.074
	(0.258)	(0.268)	(0.227)	(0.199)	(0.284)
Female	-0.217***	-0.156**	-0.212***	-0.226***	-0.210***
	(0.048)	(0.049)	(0.049)	(0.050)	(0.051)
High education	0.420***	0.363***	0.309***	0.374***	0.385***
	(0.057)	(0.056)	(0.060)	(0.062)	(0.061)
Spouse	0.201**	0.234***	0.206**	0.162*	0.197**
	(0.064)	(0.063)	(0.065)	(0.067)	(0.066)
Child(ren)	-0.079	-0.018	0.057	0.008	-0.008
	(0.059)	(0.059)	(0.059)	(0.063)	(0.063)
Metropolitan area	0.275***	0.268***	0.302***	0.283***	0.236***
	(0.055)	(0.056)	(0.057)	(0.060)	(0.060)
Constant	-0.141*	-0.082	-0.113	-0.137	-0.071
	(0.070)	(0.079)	(0.074)	(0.070)	(0.083)
ATE: positive surprise	0.202***	0.175***	0.169**	0.109	0.142**
	(0.060)	(0.052)	(0.056)	(0.066)	(0.054)
ATE: negative surprise	-0.166	-0.206	-0.309**	-0.229**	0.102
	(0.099)	(0.127)	(0.107)	(0.086)	(0.141)
Observations	1521	1501	1519	1505	1498

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the income satisfaction in the reference group. The dependent variable is how pleased/disappointed one feels with her disposable income, measured with a slider (0: Disappointed, 50: Neither disappointed nor pleased, 100: Pleased). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers. The average treatment effect, ATE, is computed by multiplying the mean of misperceptions with the coefficient of Treatment×Misperception plus the coefficient of Treatment. The mean values are calculated from the misperceptions that are absolutely larger than 10 percentage points.

Table 4. OLS results for the effect of income rank information on fairness of own disposable income

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.036	0.333	0.443**	0.285*	0.266
	(0.193)	(0.204)	(0.169)	(0.133)	(0.207)
Treatment	0.152**	0.012	-0.030	0.053	0.083
	(0.056)	(0.078)	(0.064)	(0.052)	(0.076)
Treatment × Misperception	-0.269	-0.816**	-0.694**	-0.283	-0.259
	(0.254)	(0.277)	(0.226)	(0.190)	(0.278)
Female	-0.193***	-0.206***	-0.280***	-0.310***	-0.231***
	(0.048)	(0.049)	(0.049)	(0.049)	(0.052)
High education	0.288***	0.244***	0.220***	0.214***	0.237***
	(0.051)	(0.054)	(0.057)	(0.057)	(0.056)
Spouse	0.151*	0.215***	0.196**	0.173**	0.165*
	(0.061)	(0.065)	(0.064)	(0.065)	(0.064)
Child(ren)	-0.073	-0.004	-0.019	0.007	0.007
	(0.055)	(0.059)	(0.057)	(0.059)	(0.059)
Metropolitan area	0.112*	0.070	0.198***	0.123*	0.085
	(0.052)	(0.055)	(0.052)	(0.054)	(0.055)
Constant	-0.051	-0.054	-0.002	-0.020	-0.028
	(0.071)	(0.081)	(0.075)	(0.071)	(0.083)
ATE: positive surprise	0.224***	0.252***	0.192***	0.145*	0.159**
	(0.059)	(0.052)	(0.055)	(0.063)	(0.055)
ATE: negative surprise	0.095	-0.171	-0.189	-0.016	0.020
	(0.098)	(0.132)	(0.106)	(0.083)	(0.135)
Observations	1521	1501	1519	1505	1498

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information on the perceived fairness of one's income relative to others in the reference group. The dependent variable is perceived fairness, measured with a slider (0: Unfairly low, 50: Fair, 100: Unfairly high) and recoded as 50 - abs(slider value - 50) to reflect range from Unfair to Fair. The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers. The average treatment effect, ATE, is computed by multiplying the mean of misperceptions with the coefficient of Treatment×Misperception plus the coefficient of Treatment. The mean values are calculated from the misperceptions that are absolutely larger than 10 percentage points.

Table 5. OLS results for the effect of income rank information on wage satisfaction

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.025	0.455*	0.482*	0.029	0.305
	(0.200)	(0.219)	(0.188)	(0.166)	(0.224)
Treatment	0.082	0.026	-0.037	-0.043	0.185*
	(0.064)	(0.086)	(0.075)	(0.060)	(0.084)
Treatment × Misperception	-0.216	-0.101	-0.712**	-0.207	0.329
	(0.277)	(0.302)	(0.255)	(0.223)	(0.305)
Female	-0.189***	-0.132*	-0.131*	-0.143**	-0.132*
	(0.053)	(0.053)	(0.054)	(0.055)	(0.055)
High education	0.398***	0.341***	0.328***	0.371***	0.406***
	(0.063)	(0.064)	(0.065)	(0.068)	(0.064)
Spouse	0.133*	0.122	0.139*	0.201**	0.096
	(0.067)	(0.067)	(0.068)	(0.069)	(0.067)
Child(ren)	-0.021	-0.005	0.058	-0.010	0.014
	(0.063)	(0.063)	(0.063)	(0.065)	(0.064)
Metropolitan area	0.167**	0.183**	0.200***	0.179**	0.133*
	(0.060)	(0.062)	(0.060)	(0.065)	(0.061)
Constant	-0.122	-0.043	-0.103	-0.199**	-0.074
	(0.070)	(0.085)	(0.083)	(0.073)	(0.086)
ATE: positive surprise	0.140*	0.056	0.190**	0.024	0.089
	(0.063)	(0.056)	(0.058)	(0.069)	(0.057)
ATE: negative surprise	0.037	0.004	-0.201	-0.094	0.265
	(0.109)	(0.145)	(0.124)	(0.099)	(0.150)
Observations	1413	1398	1400	1400	1393

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the wage satisfaction in the reference group. The dependent variable is how satisfied one feels with how much she earns in the current job, measured with a slider (0: Not at all satisfied, 100: Very satisfied). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers. The average treatment effect, ATE, is computed by multiplying the mean of misperceptions with the coefficient of Treatment×Misperception plus the coefficient of Treatment. The mean values are calculated from the misperceptions that are absolutely larger than 10 percentage points.

Table 6. OLS results for the effect of income rank information on life satisfaction

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.216	0.443*	0.421*	0.154	0.364
	(0.183)	(0.189)	(0.166)	(0.140)	(0.194)
Treatment	-0.001	0.001	-0.024	-0.028	0.047
	(0.060)	(0.074)	(0.065)	(0.055)	(0.075)
Treatment × Misperception	-0.286	-0.115	-0.259	-0.400*	-0.107
	(0.260)	(0.264)	(0.225)	(0.189)	(0.265)
Female	0.017	0.085	0.017	0.158**	0.070
	(0.049)	(0.050)	(0.050)	(0.050)	(0.050)
High education	0.224***	0.232***	0.212***	0.215***	0.212***
	(0.056)	(0.054)	(0.058)	(0.054)	(0.054)
Spouse	0.472***	0.400***	0.501***	0.417***	0.446***
	(0.070)	(0.069)	(0.071)	(0.068)	(0.067)
Child(ren)	0.110	0.114	0.174**	0.135*	0.145*
	(0.061)	(0.060)	(0.061)	(0.061)	(0.060)
Metropolitan area	0.174**	0.171**	0.154**	0.163**	0.073
	(0.055)	(0.056)	(0.055)	(0.056)	(0.056)
Constant	-0.505***	-0.419***	-0.508***	-0.555***	-0.457***
	(0.079)	(0.086)	(0.084)	(0.077)	(0.089)
ATE: positive surprise	0.076	0.035	0.059	0.101	0.078
	(0.059)	(0.053)	(0.057)	(0.061)	(0.053)
ATE: negative surprise	-0.061	-0.025	-0.083	-0.126	0.021
	(0.103)	(0.125)	(0.107)	(0.087)	(0.131)
Observations	1521	1501	1519	1505	1498

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the life satisfaction in the reference group. The dependent variable is life satisfaction (0: Extremely unsatisfied, 100: Extremely satisfied). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers. The average treatment effect, ATE, is computed by multiplying the mean of misperceptions with the coefficient of Treatment×Misperception plus the coefficient of Treatment. The mean values are calculated from the misperceptions that are absolutely larger than 10 percentage points.

Figure 4. Information effect on the gradient between well-being measures and misperception

Notes: Each bar plots the estimate of coefficient β_3 (95% confidence interval) of the main specification, $Y_i^k = \beta_0 + \beta_1(ER_i^j - R_i^j) + \beta_2 T_i^j + \beta_3 T_i^j \cdot (ER_i^j - R_i^j) + \gamma \mathbf{X_i} + u_i$, where Y is the outcome, T is the indicator for being in an information treatment group, $ER - R$ equals to the difference between belief and actual position, and $\mathbf{X}$ is a vector of control variables. The outcomes are satisfaction with one's disposable income, perceived fairness of one's disposable income, wage/life/job satisfaction, feeling job is meaningful, and the likelihood of searching for a new job in next six months. The outcomes are standardized z-score except that the likelihood of searching for a new job is a dummy. The z-score is computed with the mean and standard deviation of the control group. The control variables include dummy for female, dummy for having high education (Master or above), dummy for living with spouse, dummy for living with child(ren), and dummy for residing in the metropolitan area in 2018.

28

5 Robustness: Specification curve analysis

Researchers make decisions regarding how to define variables, clean the data, treat outliers and calculate standard errors, which control covariates to include, and what functional form to estimate (Gelman and Loken, 2013). Those degrees of freedom lead to different specifications, varying results, and consequently different implications. In addition, the growing literature that complement experimental data with data from registry information or socio-economic panels poses a challenge to the reproducibility and replicability of these studies because of the limited capacity to share data.

To respond to these concerns and increase the transparency of our analytical decisions, we conduct the specification curve analysis proposed by Simonsohn et al. (2020).[35] Throughout the analysis, we focus on the estimate of the coefficient of $Treatment \times Misperception$. We conduct the analysis for each outcome and treatment.

In the first step, we define the reasonable specifications. The variations of the model specifications in the analysis are summarized in Table 7. In particular, the variations arise from three types of analytical decisions: (A) sample restrictions, (B) the definition of misperception, and (C) the choice of covariates. The variation of analytical decisions gives us a total of 1920 specifications ($24 \times 5 \times 16$) except for treatment NATIONAL where there are in total 960 specifications because one sample restriction (the third criterion in the first row of Table 7) is not applicable.

Our main analysis sample includes all observations. The rightmost column in Table 7 outlines the four independent sample restrictions which we consider here: excluding the subjects with largest misperceptions; subjects who did not complete the survey; subjects for whom responding took longer than 95% of all the complete responses; and subjects with mismatched information between their self-reported age, occupation, municipality of residence or level of education, and the registry information.

We operationalize our key variable, misperception, in five ways: percentile (our main specification); decile; quintile; categorical misperception as positive, negative, and no bias; and the dummies for positive and non-positive misperception. The definitions of misperception explored here reflect the variance across the studies that have a similar design to ours. For instance, it is categorized as positive, negative and no bias, and converted to three indicators in the model of Karadja et al. (2017); it is

---

[35]We pre-registered to estimate alternative specifications to check the robustness of the results in the main specification, but not the specification curve analysis in particular.

defined as percentile in Perez-Truglia (2020), quintile in Hoy and Mager (2021), and indicators for positive and non-positive values in Hvidberg et al. (2023). In addition, we classify misperception according to the standard ten-category income measure used in World Values Survey, for example.

Concerning the choice of which covariates to include, we define four sets of covariates (see the last row of Table 7). The treatment dummy is included in our pre-registered main specification, but omitted in some related studies.[36] Excluding the treatment dummy poses an assumption in the estimation that there is no information effect when there is no misperception. This assumption can affect the coefficient estimate of $Treatment \times Misperception$ in both size and statistical significance. The other sets of covariates are the covariates of the main specification except for the treatment dummy; the labor market variables; and the survey related variables. We bundle the variables and vary the sets in the specifications.

In the second step, we estimate all the specifications defined in Table 7 for each outcome and treatment.[37] For each outcome and treatment, we plot the distribution of the coefficient estimate of $Treatment \times Misperception$ across the specifications. As depicted in Figure 5a,[38] we find that for example, the majority of the estimates for the effect of income rank in educational reference group on perceived fairness of own disposable income are negative, as we observed in main specification (see column 3 in Table 4). Second, the estimated effect size reported in the main specification is close to the median of the distribution of effect size. Third, the treatment dummy has an obviously large consequential impact on the statistical significance of the estimates: when the treatment dummy is included, the p-value of many estimates turn from below to above 0.05 (e.g., see for example the descriptive specification curve for treatment AGE in Figure C2). Such an impact of the treatment dummy occurs more often with discretized misperception than continuous misperception. Fourth, the misperception definition influences the effect size: the absolute value of the effect size is smaller when the misperception is defined as dummies than other definitions. Last, sample restrictions have little impact on the effect estimates.

---

[36]Some specifications include the indicators for the bins of misperception and their interaction with the treatment dummy, so the treatment dummy is not included for collinearity. Some specification includes only misperception and its interaction with the treatment dummy.

[37]We employed the computational tool developed by Young and Holsteen (2017) to obtain the distributions of the estimates for all outcomes except Job search intentions, as it is not straightforward to apply the tool in estimating the marginal effect of a Logit model. We set up a tailored computational method to estimate the marginal effect.

[38]See Figures C1, C2, C3, C4, C5, C6, and C7 for the descriptive specification curves of the other outcomes.

In the last step, we conduct joint statistical tests to check the robustness of the effects that warrant further investigations ($p < 0.05$) in our main specification shown in Tables 3, 4, 5, and 6. To run the tests, we construct the under-the-null distribution of each effect estimate by shuffling the randomly assigned variable in our design, the treatment dummy. This re-sampling makes the null hypothesis of no effect known to be true, as long as the assumption holds that any respondent can be assigned to the control or any treatment group. Following Simonsohn et al. (2020), we use three test statistics for statistical inference: the share of significant results out of all specifications, the median effect size, and the Stouffer Z-statistic.

As seen from the inferential specification curves in Figure 5b,[39] a large fraction of the effect estimates from the observed sample locate outside the 95% confidence interval of the under-the-null hypothesis. Table C8 summarizes the inferences of the joint tests. The null hypotheses are rejected for all the discovered effects in all the joint tests at the 5% level. The inference results remain the same when we conduct the joint tests while holding the treatment dummy always included in the specifications, as seen in Table C9.[40] Therefore, based on the specification curve analysis we conclude that the found effects are all strongly robust.

---

[39]See Figures C8a, C8b, C8c, C8d, C9a, C10a, and C11a for the inferential specification curves of the other effects.

[40]We also conduct the joint tests when holding the treatment dummy included and varying the 14 covariates individually in the specifications. This makes the number of reasonable specifications amount to around 1 000 000. For the computational intensity resulting from the large number of specifications, following the practical solution suggested in Simonsohn et al. (2020), we choose a random subset of the specifications (at each round of simulation, randomly 45360 out of the 1 000 000) to make statistical inferences. The analyses with the extensive list of specifications also show that all the found effects are robust in all the joint tests.

Table 7. Main and alternative specifications

Decision	Main specification	Alternative specifications
A) Which observations to include (Exclusion criteria 1 to 4: $3 \times 2 \times 2 \times 2$ variations)	Include all observations	Drop observation if: 1) misperception > 95% or misperception > 90%; 2) incomplete answers; 3) mismatch between register data and self-reported education if in EDUCATION or occupation if in OCCUPATION or municipality of residence if in MUNICIPALITY or birth year if in AGE; 4) survey completion time among the longest 5%
B) Operationalizing misperceptions (Five definitions: 5 variations)	Belief - actual rank as percentile, rescaled as between -1 and 1	1) Belief - actual rank as decile, rescaled; 2) Belief - actual rank as quintile, rescaled; 3) Equals -1/0/1 when misperception in percentile falls in $[-1, 0.1)/[-0.1, 0.1]/(0.1, 1]$; 4) Dummy for positive/non-positive misperception
C) Choice of covariates (Treatment-dummy, covariates of main specification excl. treatment dummy, labor market variables, and survey variables: $2 \times 2 \times 2 \times 2$ variations)	Treatment-dummy, Female, Spouse, Child(ren), Metropolitan area, High education	1) Labor market variables: rank in the corresponding reference group, occupation at two-digit level, union membership, current employment status; 2) Survey related variables: order of survey question blocks, pages, and questions, total survey completion time

Notes: This table summarizes the main and alternative reasonable specifications used to in the specification curve analysis. The first column lists the three data analytical decisions. The middle column shows the main specification as defined in the pre-analysis plan (except the control covariates that are not pre-registered) and used in the analyses in Section 4. The third column lists reasonable alternative analytical choices. For the definitions of misperception, when defined as percentile, the misperception ranges between -1 and 1 with the step of 0.01. When defined as decile (quintile), the range is also between -1 and 1 but the step is 0.1 (0.2). The specification curve analysis is conducted for each of the outcomes: Fairness of own disposable income, Satisfaction with disposable income, Wage satisfaction, Life satisfaction, Job satisfaction, Job search intentions, and Job meaningfulness. OLS regression is used for most outcomes except for Job search intentions on which we estimate the marginal effect with a Logit model. We apply heteroskedasticity-consistent standard error (hc3) in the OLS regressions.

32
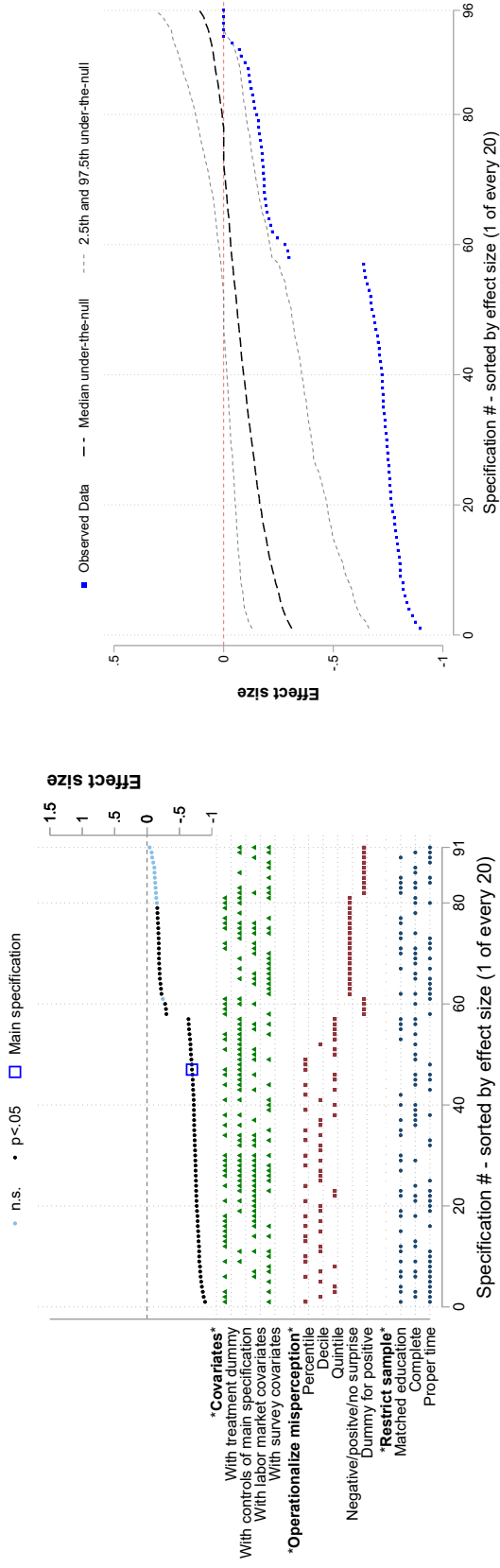
(a) Descriptive specification curve

(b) Observed and expected under-the-null specification curves

Figure 5. Descriptive and under-the-null specification curve for Fairness of own income: Treatment (Education) × Misperception

Notes: Panel (a) is the descriptive specification curve for Fairness of own income in treatment EDUCATION. In the figure at top, each dot depicts the estimate of the coefficient of Treatment×Misperception. The dots vertically aligned below in the bottom figure indicate the model specification behind those estimates. A total of 1820 specifications were estimated; to facilitate visual inspection, all the estimates are sorted and one out of every 20 estimates is plotted. NS, not significant ($P >= 0.05$). For comparison, the effect size of the main specification of Table 4 is plotted. All estimations use robust standard errors. Panel (b) plots the observed and expected under-the-null specification curves for Fairness of own income in treatment EDUCATION. The expected curves are based on 500 shuffled samples where the randomly assigned variable, treatment dummy, is shuffled. All specifications are estimated in each shuffled sample (1824 specifications). The curves plot the estimate of the coefficient of Treatment×Misperception. The resulting estimates for each shuffled sample are ranked from smallest to largest. The dashed lines depict the 2.5^{th}, 50th and 97.5^{th} percentiles for each of these ranked estimates.

6 Discussion

We turn to some implications of our results, beginning with the role of information spillovers. Consistent with the principles of controlled experimentation, we chose to reveal a single distribution rank to participants in information conditions. Individuals might nevertheless understand that distributional ranks are correlated, in which case information about one might cause beliefs about others to be updated, too. Belief spillovers are not a threat to our design, however. On the contrary, whatever belief spillovers do occur should be seen as an integral part of the treatment, and are embedded in our reduced form estimates. Further, as a practical matter, there is reason to believe that the spillovers are idiosyncratic and modest in size.[41]

As we alluded in the introduction, our work also has far-reaching implications for one of the canonical puzzles of the inequality literature, the Easterlin (1974, 1995) paradox, namely, the co-existence of a strong correlation of income and life satisfaction in national cross-sections and the absence of correlation in national time-series. Recall that the standard resolution of the paradox is to recast the former as evidence of a income-rank-dependent or relative-income-dependent utility or happiness (Clark et al., 2008). In the appendix (see Figure A11), we show, using European Social Survey data on the same sampling frame, that the same pattern characterizes Finnish data. Indeed, we extend the argument one step further and show, using our administrative and experimental data, that rank itself, both actual and believed, are strong predictors of lifetime satisfaction.

---

[41]Consider first the extreme case in which individuals "correct" *all* their rank beliefs the same amount: that is, someone who discovered that their place in the national income distribution was ten percentage points higher than first believed updates the same amount their beliefs about rank in that distribution, the municipal distribution (a plausible response, given their correlation) and all other distributions. (It is not essential that the update also equal 10 percentage points.) In this case, it would not matter to which treatment group the individual was randomized, and the estimated interaction coefficients would be the same, and equal to the synthesized treatment of all five reference groups. A cursory glance at our results tables reveals this is far from the case.

From a broader perspective, one might expect that where pairwise correlations are strong, there are also substantial information spillovers. Beliefs about municipal and national ranks, for example, are highly correlated. Thus, one might expect that a significant effect on some measure of welfare in the municipal rank condition would be associated with a significant effect in the national rank condition. This, too, is not what we observe: indeed, the relative importance of municipal standing—and the relative unimportance of national standing—is a central theme of our results.

It seems reasonable to conclude, therefore, that there was limited updating of non-treatment beliefs, and that the treatment effects of (for example) information about municipal rank do not reflect much spillover. The explanation might include, but not be limited to, bounds on cognition: the fact that misperceptions are less correlated than beliefs (0.79 for the municipal-national pair, for example, as opposed to 0.85, see panels (b) and (c) in Figure A2) is consistent with the view that individuals are more confident/better informed about some ranks than others.

Our results suggest, however, that none of these correlations are causal, and that the standard resolution of the paradox is therefore not definitive, a surprising consequence of Wolfers and Stevenson's (2008) appeal for research on the paradox that exploits exogenous variation in rank or, in our case, perceived rank. At least two explanations come to mind for the unresponsiveness of life satisfaction to our various interventions. The first is that life satisfaction is a more expansive measure than our other indicators of welfare, and that the effect of rank will be muted. The second is that it is perhaps also a long(er) term measure, in both directions: if it is *permanent* income that contributes to life satisfaction, the response to new information about *current* rank will also be muted.

Further, our challenge to the resolution of the paradox is two dimensional. On one hand, our results indicate that information about national rank often has the smallest, and least significant, effects on welfare. To be more precise, we show that the effects that operate through self-image are small, but our protocol is not designed to uncover the social image mechanism discussed in Perez-Truglia (2020). On the other, it is remarkable that with the exception of occupation, life satisfaction is insensitive to *all* information shocks, not just those about national rank. Both have important implications for empirical research on the nature and measurement of individual well-being.

On the relative unimportance of national rank, the estimated effects of age, municipality, education, and occupation ranks on our lead measure, satisfaction with disposable income, are all significant at the $p = 0.01$ level or better, for example, and an order of magnitude larger than the effect of national rank. In a similar vein, a 10 percentage point difference in municipal rank is estimated to cause a 0.08 ($p < 0.01$) standard deviations increase in fairness of income while the same increase in national rank causes only a 0.02 ($p = 0.25$) standard deviations increase.

These findings could be interpreted as evidence of "inequality as *experienced* difference" (Bowles and Carlin, 2020). That is, rank or status within occupation or neighborhood (in our case, municipality) or educational cohort is both salient and felt, whereas rank within some national distribution is an abstraction. If so, more caution is required in the interpretation of studies that leverage aggregate measures of inequality to explain individual or national outcomes, from redistributive policies (for example, Milanovic (2000)) to biodiversity loss (Holland et al., 2009).

It is worth noting that we provided information on a particular measure of relative standing (that is, pure income rank) and not on income differences between ranks,

or between one's own income and the median, or both, as in Hvidberg et al. (2023). While the predicted effect of the latter is ambiguous, consistent with the observation that the comparison and information or tunnel effects could work in opposite directions (Hirschman and Rothschild, 1973), we do not rule out the possibility that other measures might generate more substantial effects.

We turn next to what might be regarded as a welfare cost of the information provided in our protocol, the respondent's inference that he or she is in the "wrong job," as captured by job search intentions over the next six months. One of our inspirations is Card et al. (2012), who considered the effects of access to information about co-worker compensation at a single employer, the University of California system, on both job satisfaction and job search, both expected and, later, inferred. The presumptive mechanism is that negative surprises about rank reduce job satisfaction and perceived fairness, and so induce the individual to search for a better draw from the distribution of occupational wages or to switch occupations and change reference groups. Our protocol allows us to pinpoint the influence of different distributions on a range of welfare measures, including job satisfaction, as well as search intentions, with two caveats. The first is that while participants in Card et al. (2012) had to choose to access the information source—and to decide which co-workers to look up—exposure to information in the conditions we consider here was exogenous. The second is that their treatment effects are strongest for low-wage workers—and almost non-existent for high-wage workers—and our sample of mid-career Finns contains fewer low-wage workers than the labor force as a whole. We also note that the mechanism described above is framed in terms of negative surprises, although it is of course possible that positive surprises cause individuals to limit ongoing job search activities.

Figure A10 in the appendix reveals that there is at least some correlation between, on the one hand, income and job satisfaction and, on the other, job search intentions. There is less causal evidence, however, to support the claim that experienced rank is responsible for these correlations. We have already seen, for example, that for no distribution does information provision produce significant changes in job satisfaction. Table B21 and B29 in the appendix report linear and continuous spline model estimates for intended job search, and with the possible exception of an *almost* significant (at the 5% level) effect for negative surprises about occupational rank (see Figure A9), the treatment effects are small and insignificant. In future work, we plan to use administrative data to explore whether our inventions affected *actual* job changes.

We conclude this section with an example of the policy implications of our results. In particular, we consider the welfare effects of "income transparency" policies, with the caveat that we shall restrict attention to the outcomes in which all individuals learn their rank, but not absolute income differences between rank and various reference points (the median, for example). To provide a benchmark of sorts, we first note that if the average misperception was close to zero and the individual effects of positive and negative surprises were roughly symmetric, the aggregate welfare effects of transparency would be negligible. Information would only generate transfers of happiness without affecting the aggregate.[42] Within our framework, then, non-negligible effects are attributable to violations of one or both conditions.

Let us start with the "pure information" channel, i.e., the effects exclusive of any differential responses to information. In Table B30, we report the standardized mean changes, including standard errors, for each of our welfare outcomes for the whole sample when each of four distinct misperceptions (education, occupation, municipality, and age) are corrected—that is, set equal to zero—using our benchmark (non-spline) specifications. We also report separate effects, and subsample sizes, for positive and negative misperceptions, but do not include the national distribution because, to reprise one of our themes, the effects are both small and insignificant. Consider first the effects of transparency about rank in the municipality reference group, some of the most striking in our research. Mean satisfaction with disposable income increases almost 0.12 standard deviations while mean fairness increases almost 0.19 standard deviations, both of which represent substantial welfare improvements. What explains this? The mean increase for pessimists—that is, those for whom transparency produces a positive surprise—is 0.145 standard deviations, while the mean decrease for optimists is 0.122 standard deviations (consistent with our earlier observation that the absolute magnitude of positive surprises is also, in this case, somewhat larger) and, more important, pessimists outnumber optimists almost 9 to 1. (This pessimism, it should be recalled, is not universal, but is consistent with, for example, the work of Karadja et al. (2017) on Sweden.) The explanation for the aggregate fairness effect is similar, but not identical, because the magnitudes of positive and negative surprises differ more: the overall increase is much closer to the large mean increase (0.219) for pessimists.

Across these two dimensions then, income transparency is welfare-enhancing be-

---

[42]Admittedly, this argument presupposes an anonymous utilitarian approach to evaluating societal welfare.

cause it provides large (if one time) benefits to the large number who believe their place in the local income distribution was lower than it was, and because the acquisition of such knowledge has substantial effects on individual welfare. Consistent with our earlier results, however, the aggregate effects on wage satisfaction are small, and those for life satisfaction negligible.

How much do asymmetries matter? There are more positive surprises than negative in our data, but if, in a form of loss aversion, the latter were more painful than the former were pleasurable, our previous finding of a net positive effect might be attenuated, even reversed. Recall, however, that our spline estimates suggested, contra Karadja et al. (2017); Perez-Truglia (2020); Albers et al. (2022) and others, that the effects are more or less symmetric, so it does not come as much surprise, that the extended welfare calculations reported in Table B31, are not much different. For municipal rank revelation, for example, the means of satisfaction with disposable income and perceived fairness both decline, but the fall is minimal: from 0.117 to 0.115 standard deviations for the former, and 0.187 to 0.185 for the latter.

7 Conclusion

Our study employs a pre-registered information provision experiment to investigate the effects of income rank on individual well-being. We document, first, that income rank has causal effects on income-related measures of well-being, such as satisfaction with own income, perceived fairness about own income, and wage satisfaction. Second, we do not find any effects of income rank on the non-income-related well-being measures, such as life and job satisfaction, and the perceived job meaningfulness. Third, income ranks in different reference groups affect individual well-being differently. One startling finding is that national income rank, which is much emphasized in the literature, has a weak and statistically insignificant effect on all the considered well-being measures. Information about income rank among those with the same educational level or those living in the same municipality have a much stronger effect on individual well-being. Last, the symmetry of the effects between the negatively and positively surprised respondents cannot be rejected for most measures and treatments except for very few instances. We confirm the robustness of the discovered effects using the specification curve analysis. In addition, we discuss this particular method of data analysis and provide arguments for its use in studies that have rich register data sets.

Consistent with our pre-analysis plan, we expect to explore other questions in future work, including the implications of endogenous reference groups and the relationships between income rank and policy preferences. Our setup would also allow for a novel analysis of the effects of rank information on economic decisions and behavior, for example by examining behavioral responses in register data.

References

Albers, Thilo, Felix Kersting, and Fabian Kosse, "Income Misperception and Populism," 2022.

Alesina, Alberto, Rafael Di Tella, and Robert MacCulloch, "Inequality and happiness: are Europeans and Americans different?," *Journal of public economics*, 2004, *88* (9-10), 2009–2042.

Almås, Ingvild, Alexander W. Cappelen, and Bertil Tungodden, "Cut-throat Capitalism versus Cuddly Socialism: Are Americans More Meritocratic and Efficiency-Seeking than Scandinavians?," *Journal of Political Economy*, 2020, *128* (5), 1753–1788.

Bellemare, Charles, Sabine Kröger, and Arthur Van Soest, "Measuring Inequity Aversion in a Heterogeneous Population Using Experimental Decisions and Subjective Probabilities," *Econometrica*, 2008, *76* (4), 815–839.

Bolton, Gary E. and Axel Ockenfels, "ERC: A Theory of Equity, Reciprocity, and Competition," *American Economic Review*, March 2000, *90* (1), 166–193.

Bond, Timothy N. and Kevin Lang, "The Sad Truth about Happiness Scales," *Journal of Political Economy*, 2019, *127* (4), 1629–1640.

Bowles, Samuel and Wendy Carlin, "Inequality as experienced difference: A reformulation of the Gini coefficient," *Economics Letters*, 2020, *186*, 108789.

Boyce, Christopher J., Gordon D.A. Brown, and Simon C. Moore, "Money and Happiness: Rank of Income, Not Income, Affects Life Satisfaction," *Psychological Science*, 2010, *21* (4), 471–475. PMID: 20424085.

Burger, Martijn J, Phillip S Morrison, Martijn Hendriks, and Marloes M Hoogerbrugge, "Urban-rural happiness differentials across the world," *World happiness report*, 2020, *2020*, 66–93.

Cappelen, Alexander W., Astri Drange Hole, Erik Ø Sørensen, and Bertil Tungodden, "The Pluralism of Fairness Ideals: An Experimental Approach," *American Economic Review*, June 2007, *97* (3), 818–827.

Card, David, Alexandre Mas, Enrico Moretti, and Emmanuel Saez, "Inequality at work: The effect of peer salaries on job satisfaction," *American Economic Review*, October 2012, *102* (6), 2981–3003.

Chen, Daniel L, Martin Schonger, and Chris Wickens, "oTree—An open-source platform for laboratory, online, and field experiments," *Journal of Behavioral and Experimental Finance*, 2016, *9*, 88–97.

Clark, Andrew E, "Job satisfaction and gender: why are women so happy at work?," *Labour economics*, 1997, *4* (4), 341–372.

_ , "Four decades of the economics of happiness: Where next?," *Review of Income and Wealth*, 2018, *64* (2), 245–269.

Clark, Andrew E. and Claudia Senik, "Who Compares to Whom? The Anatomy of Income Comparisons in Europe*," *The Economic Journal*, 2010, *120* (544), 573–594.

_ **and Conchita D'Ambrosio**, "Chapter 13 - Attitudes to Income Inequality: Experimental and Survey Evidence," in Anthony B. Atkinson and François Bourguignon, eds., *Handbook of Income Distribution*, Vol. 2 of Handbook of Income Distribution, Elsevier, 2015, pp. 1147–1208.

Clark, Andrew E, Niels Westergård-Nielsen, and Nicolai Kristensen, "Economic satisfaction and income rank in small neighbourhoods," *Journal of the European Economic Association*, 2009, *7* (2-3), 519–527.

_ **, Paul Frijters, and Michael A Shields**, "Relative income, happiness, and utility: An explanation for the Easterlin paradox and other puzzles," *Journal of Economic literature*, 2008, *46* (1), 95–144.

Corneo, Giacomo and Olivier Jeanne, "Conspicuous consumption, snobbism and conformism," *Journal of Public Economics*, 1997, *66* (1), 55–71.

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

Cullen, Zoë and Ricardo Perez-Truglia, "How much does your boss make? The effects of salary comparisons," *Journal of Political Economy*, 2022, *130* (3), 766–822.

Di Tella, Rafael, John Haisken-De New, and Robert MacCulloch, "Happiness adaptation to income and to status in an individual panel," *Journal of Economic Behavior & Organization*, 2010, *76* (3), 834–852.

Duesenberry, James S., *Income, Saving, and the Theory of Consumer Behavior*, Cambridge, Mass.: Harvard University Press, 1949.

Easterlin, Richard A, "Does economic growth improve the human lot? Some empirical evidence," in "Nations and households in economic growth," Elsevier, 1974, pp. 89–125.

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

Engelhardt, Carina and Andreas Wagener, "What do Germans think and know about income inequality? A survey experiment," *Socio-Economic Review*, October 2018, *16* (4), 743–767.

Falk, Armin, Anke Becker, Thomas Dohmen, Benjamin Enke, David Huffman, and Uwe Sunde, "Global Evidence on Economic Preferences*," *The Quarterly Journal of Economics*, 05 2018, *133* (4), 1645–1692.

Fehr, Dietmar, Johanna Mollerstrom, and Ricardo Perez-Truglia, "Your Place in the World: Relative Income and Global Inequality," *American Economic Journal: Economic Policy*, November 2022, *14* (4), 232–68.

Fehr, Ernst and Klaus M. Schmidt, "A Theory of Fairness, Competition, and Cooperation," *The Quarterly Journal of Economics*, 1999, *114* (3), 817–868.

$\_$ **and Klaus M Schmidt**, "The economics of fairness, reciprocity and altruism–experimental evidence and new theories," *Handbook of the economics of giving, altruism and reciprocity*, 2006, *1*, 615–691.

Fernández-Albertos, José and Alexander Kuo, "Income Perception, Information, and Progressive Taxation: Evidence from a Survey Experiment," *Political Science Research and Methods; Cambridge*, January 2018, *6* (1), 83–110.

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

Festinger, Leon, "A theory of social comparison processes," *Human relations*, 1954, *7* (2), 117–140.

Frank, Robert H, "Frames of Reference and the Quality of Life," *The American economic review*, 1989, *79* (2), 80–85.

Gelman, Andrew and Eric Loken, "The garden of forking paths: Why multiple comparisons can be a problem, even when there is no "fishing expedition" or "p-hacking" and the research hypothesis was posited ahead of time," 2013. Unpublished.

Gill, David, Zdenka Kissová, Jaesun Lee, and Victoria Prowse, "First-Place Loving and Last-Place Loathing: How Rank in the Distribution of Performance Affects Effort Provision," *Management Science*, 2019, *65* (2), 494–507.

Godechot, Olivier and Claudia Senik, "Wage comparisons in and out of the firm. Evidence from a matched employer–employee French database," *Journal of Economic Behavior & Organization*, 2015, *117*, 395–410.

Haaland, Ingar, Christopher Roth, and Johannes Wohlfart, "Designing Information Provision Experiments," *Journal of Economic Literature*, March 2023, *61* (1), 3–40.

Hirschman, Albert O and Michael Rothschild, "The changing tolerance for income inequality in the course of economic development: With a mathematical appendix," *The Quarterly Journal of Economics*, 1973, *87* (4), 544–566.

Holland, Tim G, Garry D Peterson, and Andrew Gonzalez, "A cross-national analysis of how economic inequality predicts biodiversity loss," *Conservation biology*, 2009, *23* (5), 1304–1313.

Hoy, Christopher and Franziska Mager, "Why Are Relatively Poor People Not More Supportive of Redistribution? Evidence from a Randomized Survey Experiment across Ten Countries," *American Economic Journal: Economic Policy*, November 2021, *13* (4), 299–328.

Hvidberg, Kristoffer B, Claus T Kreiner, and Stefanie Stantcheva, "Social Positions and Fairness Views on Inequality," *The Review of Economic Studies*, 03 2023. Forthcoming.

Johansson, Edvard, "Job satisfaction in Finland: Some results from the European Community household panel 1996-2001," Technical Report, ETLA Discussion Papers 2004.

Kaiser, Caspar and Andrew J. Oswald, "The scientific value of numerical measures of human feelings," *Proceedings of the National Academy of Sciences*, 2022, *119* (42), e2210412119.

Karadja, Mounir, Johanna Mollerstrom, and David Seim, "Richer and holier than thou? The effect of realtive income improvements on demand for redistribution," *Review of Economics & Statistics*, May 2017, *99* (2), 201–212.

Kirchler, Michael, Florian Lindner, and Utz Weitzel, "Rankings and Risk-Taking in the Finance Industry," *The Journal of Finance*, 2018, *73* (5), 2271–2302.

Kuhn, Peter, Peter Kooreman, Adriaan Soetevent, and Arie Kapteyn, "The Effects of Lottery Prizes on Winners and Their Neighbors: Evidence from the Dutch Postcode Lottery," *American Economic Review*, August 2011, *101* (5), 2226–47.

Kuziemko, Ilyana, Ryan W Buell, Taly Reich, and Michael I Norton, ""Last-place aversion": Evidence and redistributive implications," *The Quarterly Journal of Economics*, 2014, *129* (1), 105–149.

Layard, Richard, *Happiness: Lessons From A New Science*, Penguin Books, 2005.

Lindqvist, Erik, Robert Östling, and David Cesarini, "Long-Run Effects of Lottery Wealth on Psychological Well-Being," *The Review of Economic Studies*, 02 2020, *87* (6), 2703–2726.

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

Manski, Charles F., "Economic Analysis of Social Interactions," *Journal of Economic Perspectives*, September 2000, *14* (3), 115–136.

Martinangeli, Andrea FM and Lisa Windsteiger, "Last word not yet spoken: a reinvestigation of last place aversion with aversion to rank reversals," *Experimental Economics*, 2021, *24* (3), 800–820.

McBride, Michael, "Relative-income effects on subjective well-being in the cross-section," *Journal of Economic Behavior & Organization*, July 2001, *45* (3), 251–278.

Milanovic, Branko, "The median-voter hypothesis, income inequality, and income redistribution: an empirical test with the required data," *European Journal of Political Economy*, 2000, *16* (3), 367–410.

Perez-Truglia, Ricardo, "The effects of income transparency on well-being: Evidence from a natural experiment," *American Economic Review*, 2020, *110* (4), 1019–54.

Schlag, Karl H. and Joël J. van der Weele, "A method to elicit beliefs as most likely intervals," *Judgement and Decision Making*, September 2015, *10* (5), 456–468.

Simonsohn, Uri, Joseph P Simmons, and Leif D Nelson, "Specification curve analysis," *Nature Human Behaviour*, November 2020, *4* (11), 1208–1214.

Veblen, Thorstein, "The theory of the leisure class. (republished, 1934, by new york: Modern library)," 1899.

Weesie, Jeroen, "On Seemingly Unrelated Estimation and the Cluster-Adjusted Sandwich Estimator," *Stata Technical Bulletin*, 1999, *52* (10), 34–47.

Wisman, Jon D, "Adam Smith and Thorstein Veblen on the Pursuit of Status Through Consumption versus Work," *Cambridge Journal of Economics*, 2019, *43* (1), 17–36.

Wolfers, Justin and Betsey Stevenson, "Economic growth and subjective well-being: reassessing the Easterlin Paradox," 2008.

Xie, Wenwen, Benjamin Ho, Stephan Meier, and Xinyue Zhou, "Rank reversal aversion inhibits redistribution across societies," *Nature Human Behaviour*, 2017, *1* (8), 1–5.

Young, Cristobal and Katherine Holsteen, "Model Uncertainty and Robustness: A Computational Framework for Multimodel Analysis," *Sociological Methods & Research*, 2017, *46* (1), 3–40.

Appendix A   Figures

Figure A1. Example of the treatment of information in treatment EDUCATION

In this section we would like to give you information about the relationship between your income and the incomes of **those who had the same level of education** in 2018.

By income, we refer to the individual total annual disposable income, which contains income from labor and capital, as well as all transfers and subsidies like public unemployment payments and pensions (i.e. disposable income).

— individual with highest income

— Your actual position: 73%

— Your assessment: 53%

— individual with lowest income

According to your assessment, **53%** of people who had the same level of education had lower income than you in 2018.

Actually, based on register data, **73%** of people who had the same level of education had lower income than you in 2018.

The guess above may not be the one that determines your bonus payment. One of the five guesses will be randomly selected to determine whether you get a bonus of 5 euro in addition to the 15 euro compensation.

Please choose the correct statement according to the information you see above. (This question is just to verify that you have understood the information in the figure.)

○ The actual proportion of people with lower income than I is **larger** than I thought.

○ The actual proportion of people with lower income than I is **smaller** than I thought.

○ The actual proportion of people with lower income than I is the **same** as I thought.

Notes: The participants in treatment EDUCATION see their disposable income rank among people who have the same educational level. They also see their assessment of the rank and need to answer the interpretation question correctly before they proceed. The other treatments provide the information in the same way except the specified reference group differs based on the treatment.

Figure A2. Correlations between actual ranks and perceptions about ranks in reference groups

(a) Correlations between actual ranks

	Rank, Age	Rank, Municipality	Rank, Education	Rank, Occupation
Rank, Municipality	0.91***			
Rank, Education	0.75***	0.75***		
Rank, Occupation	0.71***	0.70***	0.72***	
Rank, National	0.96***	0.96***	0.77***	0.72***

(b) Correlations between beliefs about ranks

	Belief, Age	Belief, Municipality	Belief, Education	Belief, Occupation
Belief, Municipality	0.83***			
Belief, Education	0.74***	0.72***		
Belief, Occupation	0.65***	0.62***	0.68***	
Belief, National	0.83***	0.85***	0.70***	0.60***

(c) Correlations between misperceptions about ranks

	Misp., Age	Misp., Municipality	Misp., Education	Misp., Occupation
Misp., Municipality	0.69***			
Misp., Education	0.65***	0.66***		
Misp., Occupation	0.62***	0.56***	0.62***	
Misp., National	0.72***	0.79***	0.65***	0.56***

Notes: The figures display Pearson correlations between survey respondents' actual ranks (panel a), beliefs about their ranks (panel b) and misperceptions (belief-actual rank) about ranks of the main analysis sample. Actual ranks are based on register data provided by Statistics Finland. Beliefs about ranks are based on participants' answers to the incentivized belief elicitation questions. The figures use data from the main analysis sample. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Figure A3. Beliefs about disposable income rank and actual rank in reference groups

(a) Education

(b) Occupation

(c) Municipality
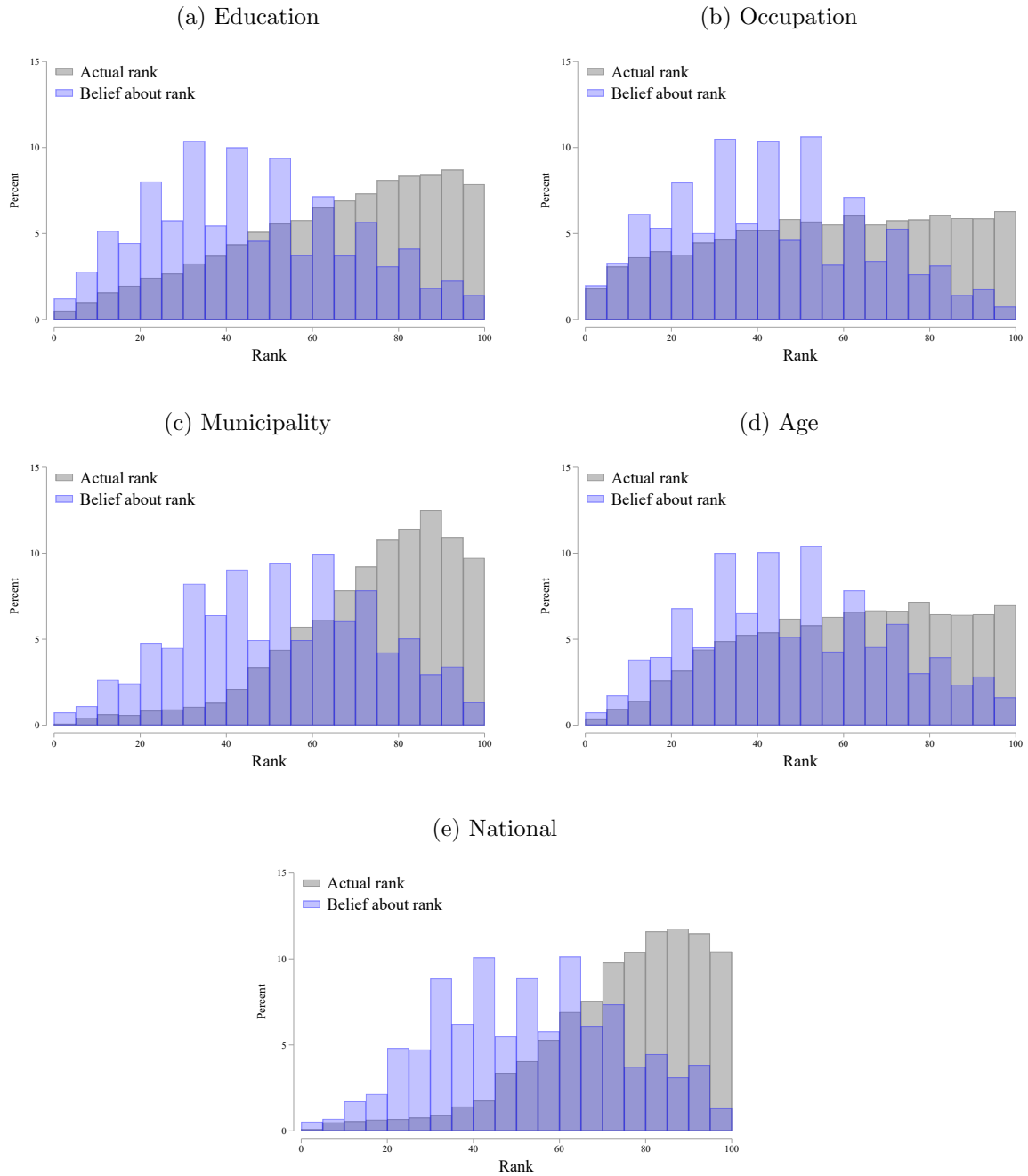
(d) Age

(e) National

Notes: Distributions of beliefs about disposable income ranks (blue) and actual ranks (gray) in reference groups a) Education, b) Occupation, c) Municipality, d) Age and e) National. Perceived rank is elicited in the belief elicitation section of the survey (see Appendix E). Actual rank is based on register data provided by Statistics Finland. The figures use data from the full survey sample.

Figure A4. Misperceptions about disposable income rank

(a) Education

(b) Occupation

(c) Municipality
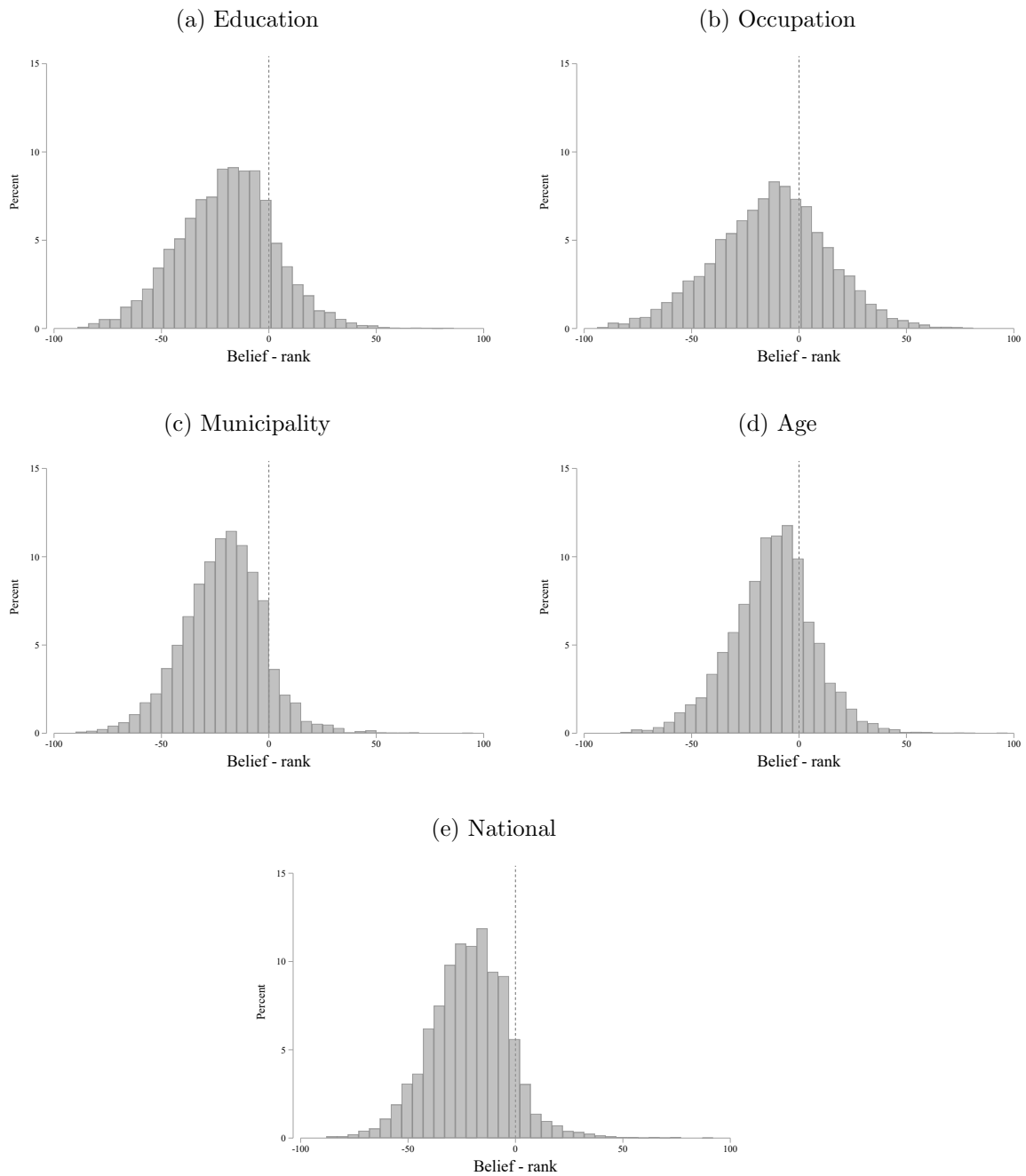
(d) Age

(e) National

Notes: Distribution of misperceptions, defined as the belief - actual rank, concerning relative income position in reference groups a) Education, b) Occupation, c) Municipality, d) Age and e) National. Misperceptions are defined as the difference between perceived and actual rank (belief - rank). Negative values correspond to underestimation and positive values to overestimation. Perceived rank is elicited in the belief elicitation section of the survey (see Appendix E). Actual rank is based on register data provided by Statistics Finland. The figures use data from the full survey sample.

Figure A5. Comparison of misperceptions

(a) National and Education
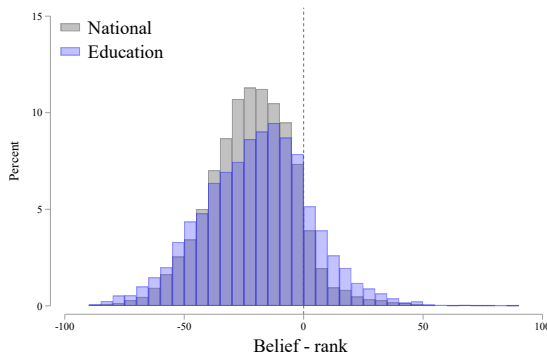
(b) National and Occupation
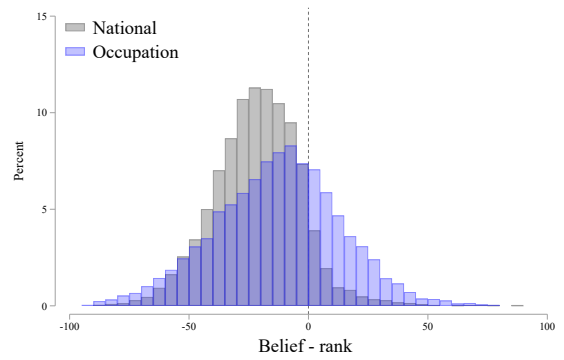
(c) National and Municipality
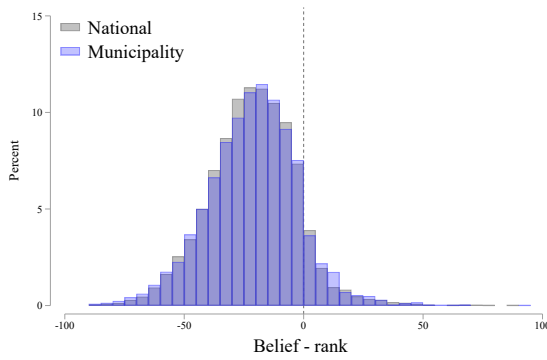
(d) National and Age
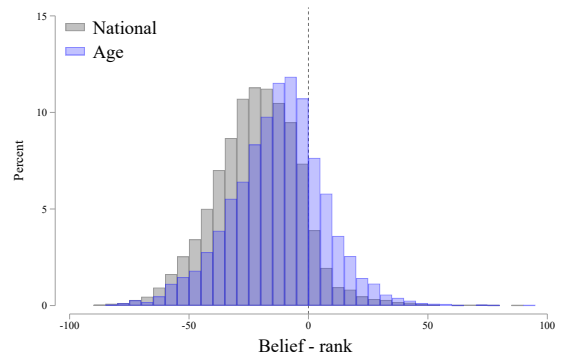
Notes: Comparison of misperceptions about disposable income rank between reference groups a) Education, b) Occupation, c) Municipality and d) Age, and reference group National. Misperceptions are defined as the difference between perceived and actual rank. Negative values correspond to underestimation and positive values to overestimation. Actual rank in a given reference group is based on register data provided by Statistics Finland. The figures use data from the full survey sample.

Figure A6. Misperceptions by rank in reference groups

(a) Education

(b) Occupation

(c) Municipality

(d) Age

(e) National
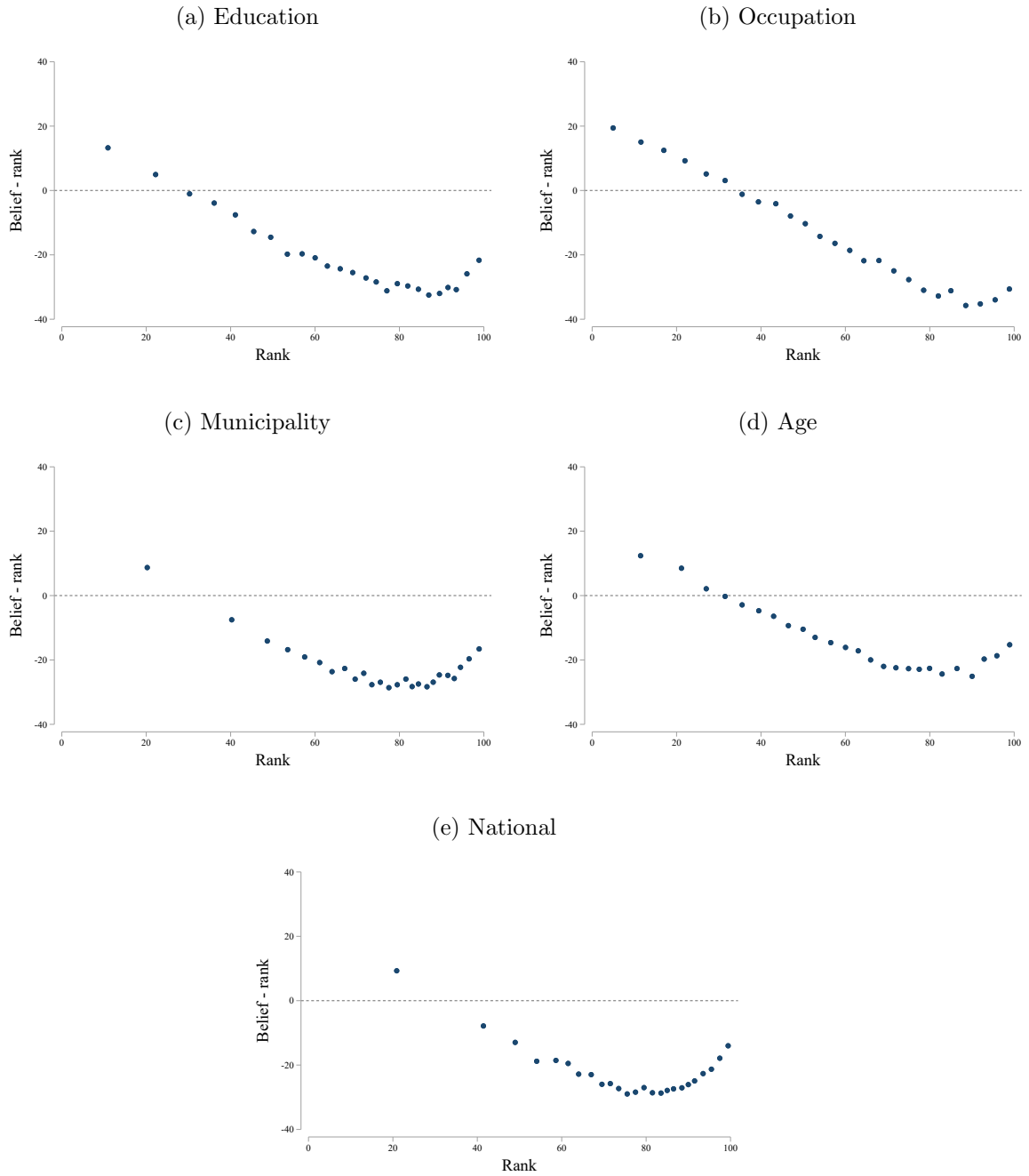
Notes: Misperceptions about disposable income rank (belief - rank) by actual rank in 25 equal-sized bins in reference groups. Perceived rank is elicited in the belief elicitation section of the survey (see Appendix E). Actual rank is based on register data provided by Statistics Finland. The figures use data from the full survey sample.

Figure A7. Distribution of individual well-being measures in control group

(a) Fairness of own disposable income

(b) Satisfaction with disposable income

(c) Life satisfaction

(d) Job satisfaction

(e) Wage satisfaction

(f) Job meaningfulness
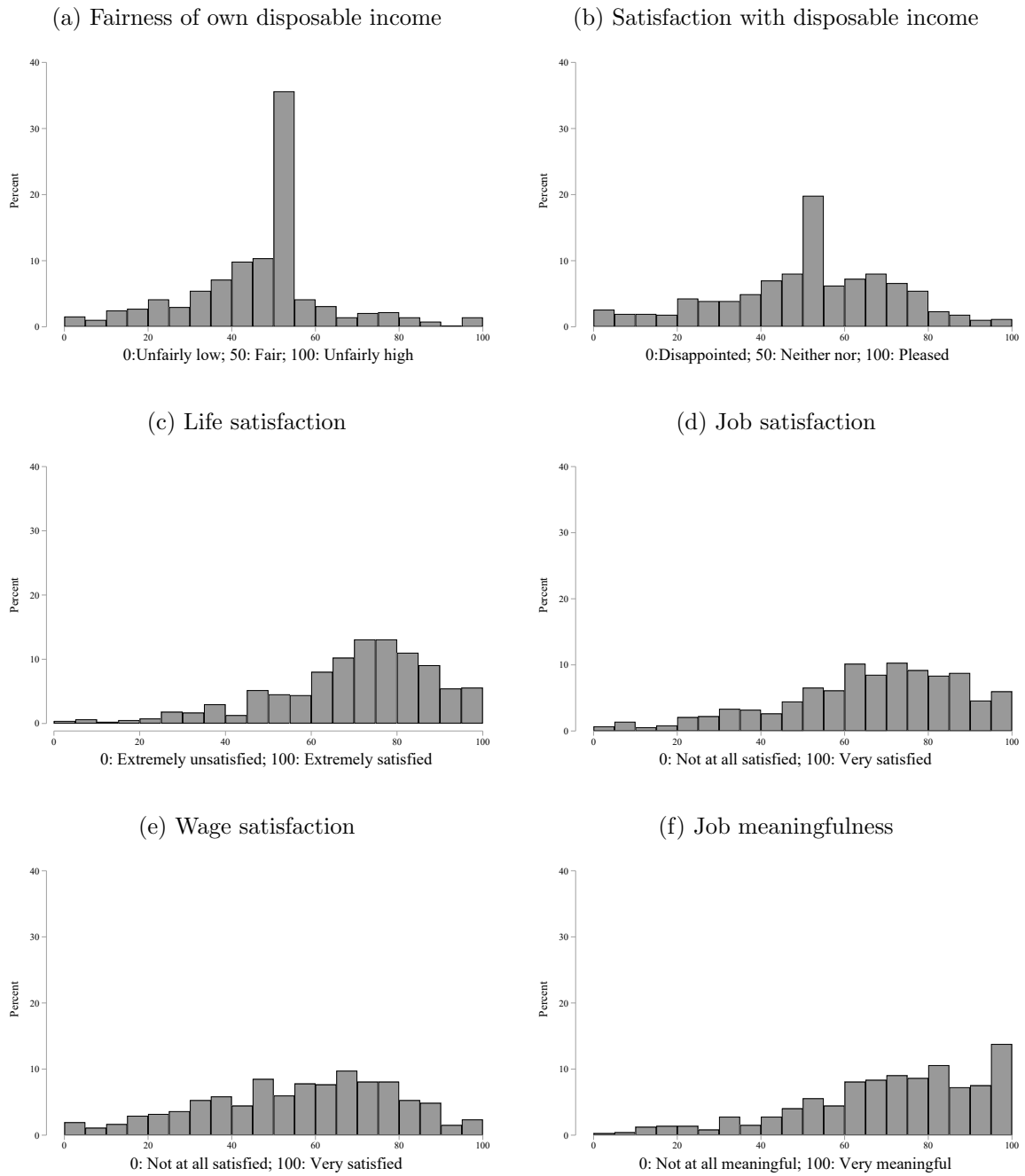
Notes: Distribution of a) perceptions on fairness of own disposable income, b) satisfaction with disposable income, c) life satisfaction, d) job satisfaction, e) life satisfaction and f) meaninfgulness of own job. All figures use data from baseline treatment CONTROL.

52

Figure A8. Correlations between outcome variables

	Satisfaction with income	Fairness	Life satisfaction	Wage satisfaction	Job satisfaction
Fairness	0.56***				
Life satisfaction	0.42***	0.25***			
Wage satisfaction	0.71***	0.43***	0.39***		
Job satisfaction	0.27***	0.14***	0.40***	0.41***	
Job meaningfulness	0.12**	-0.03	0.34***	0.20***	0.64***
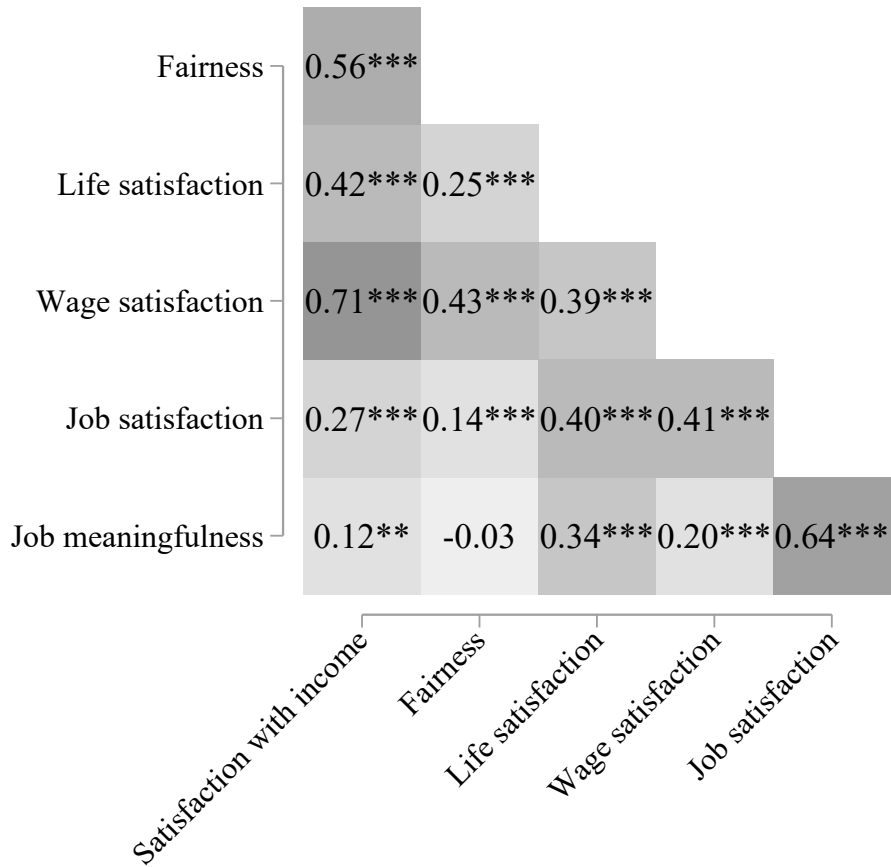
Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Pairwise correlations between outcome variables using data from the baseline treatment CONTROL.

Figure A9. Job search intentions

■ Education　• Occupation　▲ Municipality　× Age　○ National
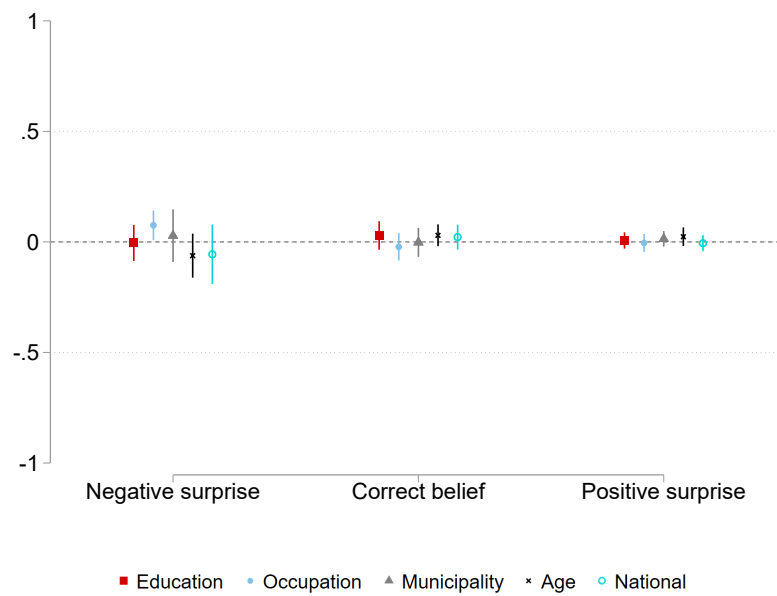
Notes: Each bar plots the marginal effect of the rank information on the likelihood of searching for a new job (95% confidence interval) given the category of misperception about the income rank. The dependent variable is a dummy that equals one if a respondent is very likely to search for a new job in the next six months and equals zero otherwise. "Negative surprise" refers to those who overestimate their income rank by more than 10 percentage points, "positive surprise" to those who underestimate their rank by more than 10 percentage points and "correct belief" to those whose assessment of their position is less than or equal to 10 percentage points in absolute terms.

Figure A10. Compare well-being measures between intentions to search for a new job

(a) Wage satisfaction

(b) Job satisfaction

(c) Job meaningfulness

(d) Satisfaction with own disposable income

Intentions to search for a new job
☐ No   ☐ Yes
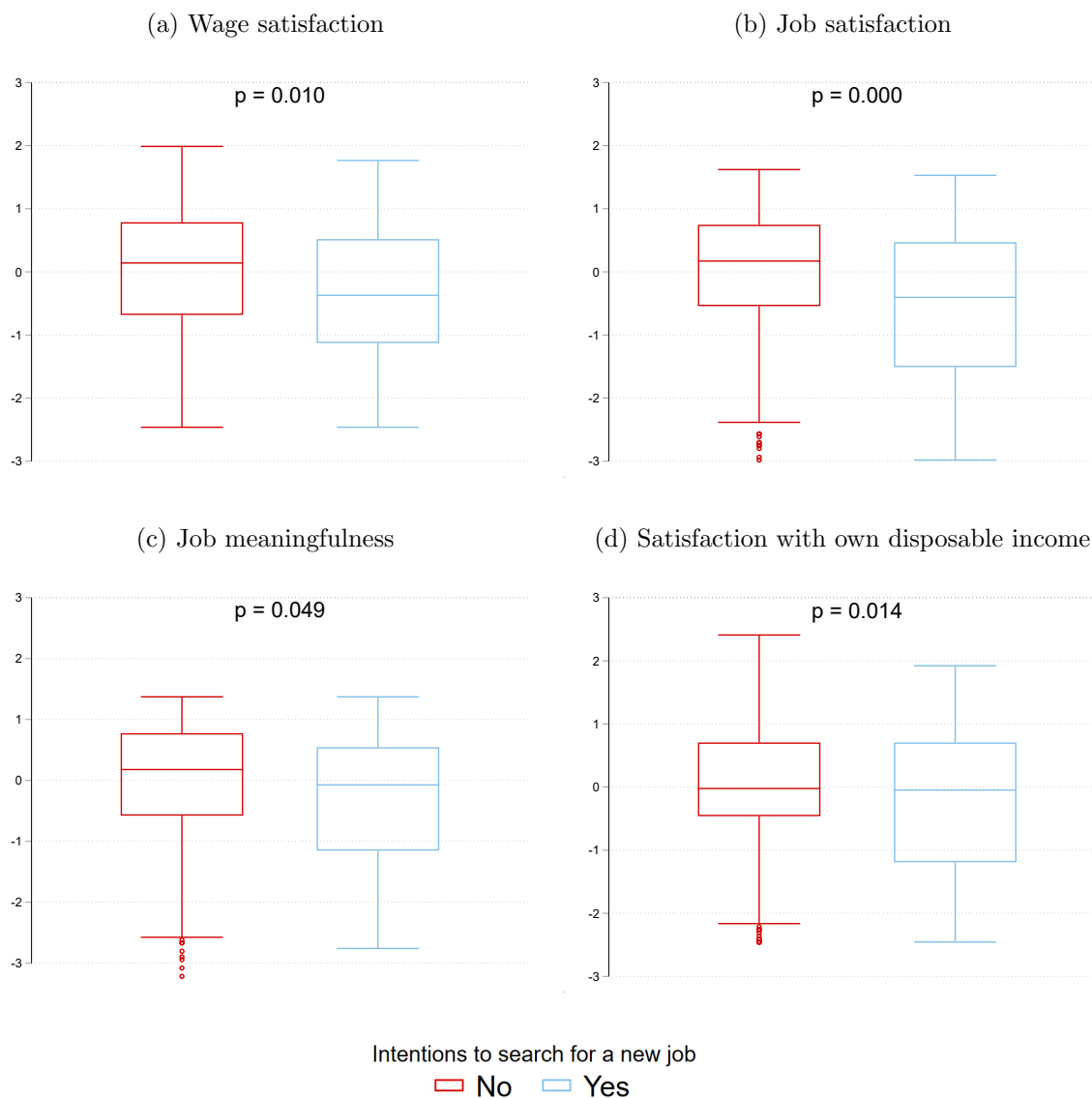
Notes: Each box plots the satisfaction with wage (panel a), the satisfaction with job (panel b), the perceived meaningfulness of job (panel c), and the satisfaction with one's own disposable income (panel d) of the respondents in the treatment CONTROL who do not see their income position. The p-value in each plot are from the t-test of the respective outcome between the respondents who have intentions to search for a new job and those who do not have such intentions. The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation.

Figure A11. Life satisfaction and household income of 35-45 year-old Finns in the European Social Survey data
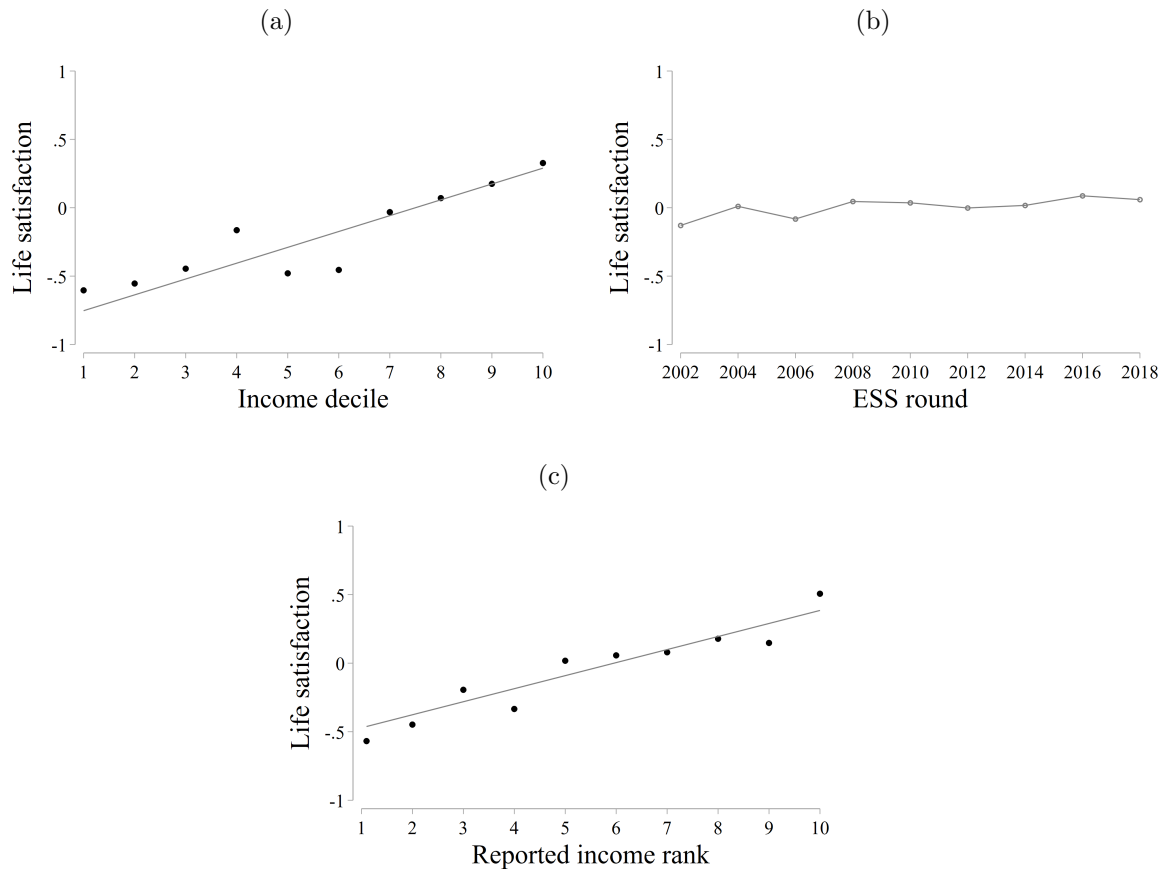
Notes: Panel (a) depicts the correlation between life satisfaction and household income for Finns aged 35 to 45 who are in the workforce (as defined by main activity during the last 7 days) using European Social Survey (ESS) data from round 9 (2018). Panel (b) shows the evolution of life satisfaction for Finns aged 35 to 45 who are in the workforce over ESS rounds 1-9 (2002-2018). Panel (c) shows the correlation between life satisfaction and belief about own individual disposable income rank ("reported income rank"), classified into deciles, for the CONTROL group of respondents of the online survey experiment.

Appendix B Tables

B.1 Survey data and sample

Table B1. The number and rate of responses and completions by treatment

	CONTROL	EDUCATION	OCCUPATION	MUNICIPALITY	AGE	NATIONAL	CHOICE	Total
Invited	2407	2400	2394	2403	2404	2401	5591	20000
Responded	821	801	796	814	800	770	1840	6642
Finished	766	745	729	726	742	723	1690	6121
Response rate (%)	34	33	33	34	33	32	33	33
Completion rate (%)	93	93	92	89	93	94	92	92

Notes: This table presents the number and rate of responses and completions by treatments.

Table B2. Point at which respondents stop completing the survey

The survey block at which the participant quit	N	Share (%)
Login page	95	1.4
Background questions	32	0.5
Belief elicitation	191	2.9
Preferred information (only in CHOICE treatment)	9	0.1
Information provision treatment	87	1.3
Job and salary	9	0.1
Just world beliefs	7	0.1
Social preferences	4	0.1
Political preferences	78	1.2
Incentivized tasks	8	0.1
Summary page	6121	92.2
Total	6642	100.0

Notes: Number and share of respondents who drop out at a given survey page or block. Job and salary, Just world beliefs and Political preferences blocks are in random order. Summary page is the final page of the survey and reaching it implies completing the survey.

Table B3. Summary demographic characteristics

	(1) Started survey	(2) Finished survey	(3) Sampling frame population
Female	0.49	0.49	0.49
Age	37.96	37.93	38.06
Spouse	0.76	0.76	0.75
Child(ren)	0.65	0.65	0.68
Finnish	0.95	0.95	0.95
Self employed	0.06	0.05	0.09
Disposable income (log)	10.34	10.34	10.33
Basic education	0.03	0.03	0.05
Upper secondary education	0.44	0.44	0.46
Bachelor level education	0.32	0.31	0.27
Master level of education (or higher)	0.21	0.22	0.22
Metropolitan area	0.25	0.25	0.23
Observations	6,642	6,121	542,756

Notes: Summary demographic characteristics of the full survey sample (column 1), those who finished completing the survey (column 2) and sampling frame population (columns 3). Survey sample includes respondents who started completing the survey. Sampling frame population is the population of Finns restricted according to the sampling frame criteria. All variables are indicators except for age and disposable income. Finnish refers to Finnish as mother tongue; basic, upper secondary, bachelor and master or higher to the highest earned educational degree; urban, semi-urban and rural area to type of municipality of residence; Metropolitan area to area consisting of Helsinki, Espoo, Vantaa and Kauniainen.

Table B4. Balance of randomization

	CONTROL	EDUCATION	OCCUPATION	MUNICIPALITY	AGE	NATIONAL	CHOICE
Disposable income (log)	10.356	-0.002	-0.027	-0.021	-0.017	-0.018	-0.025
	(0.012)	(0.018)	(0.018)	(0.019)	(0.018)	(0.019)	(0.015)
Misperception (National)	-22.280	0.713	-0.034	1.232	1.196	1.230	-0.606
	(0.649)	(0.928)	(0.901)	(0.930)	(0.916)	(0.979)	(0.782)
Female	0.497	-0.030	0.031	-0.022	-0.008	-0.006	0.003
	(0.017)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.021)
Age	38.129	-0.390	-0.054	-0.019	-0.125	-0.263	-0.253
	(0.111)	(0.156)	(0.158)	(0.157)	(0.159)	(0.159)	(0.133)
Spouse	0.741	0.025	-0.008	0.028	0.032	-0.018	0.013
	(0.015)	(0.021)	(0.022)	(0.021)	(0.021)	(0.022)	(0.018)
Child(ren)	0.698	-0.010	-0.025	-0.027	-0.012	-0.039	-0.018
	(0.016)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.019)
Finnish	0.954	-0.005	-0.004	0.000	0.004	0.015	-0.014
	(0.007)	(0.011)	(0.011)	(0.010)	(0.010)	(0.010)	(0.009)
Basic education	0.033	-0.008	-0.009	0.003	-0.002	-0.002	-0.006
	(0.006)	(0.008)	(0.008)	(0.009)	(0.008)	(0.009)	(0.007)
Upper secondary education	0.443	-0.018	0.028	-0.011	0.005	-0.017	-0.007
	(0.017)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.021)
Bachelor education	0.315	0.002	-0.010	-0.017	-0.007	0.000	0.016
	(0.016)	(0.023)	(0.023)	(0.021)	(0.023)	(0.023)	(0.020)
Master or higher education	0.211	0.024	-0.009	0.025	0.003	0.019	-0.003
	(0.014)	(0.021)	(0.020)	(0.021)	(0.020)	(0.021)	(0.017)
Self-employed	0.054	0.016	0.008	-0.004	0.006	-0.000	-0.003
	(0.008)	(0.012)	(0.012)	(0.012)	(0.012)	(0.011)	(0.009)
Employee	0.946	-0.016	-0.008	0.004	-0.006	0.000	0.003
	(0.008)	(0.012)	(0.012)	(0.012)	(0.012)	(0.011)	(0.009)
Urban municipality	0.788	0.007	-0.010	-0.017	-0.021	-0.010	-0.032
	0.014	0.020	0.021	0.021	0.021	0.021	0.017
Semiurban municipality	0.129	0.004	0.015	0.011	0.008	0.006	0.017
	(0.012)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.014)
Rural municipality	0.083	-0.012	-0.001	0.006	0.013	0.004	0.016
	(0.010)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.012)
Metropolitan	0.246	0.020	0.013	-0.004	0.018	0.001	-0.012
	(0.015)	(0.022)	(0.022)	(0.021)	(0.022)	(0.022)	(0.018)

Notes: Rows show a regression of a predetermined variable on treatment dummies. CONTROL corresponds to the constant and columns 2-7 show the difference of the treatment group to the control group. Robust standard errors are in parentheses. None of the differences are statistically significant at 5% level. Dependent variables are indicators except for disposable income (log), misperception (National) and age. Misperception (National) is prior belief - actual rank in the national income distribution. Finnish refers to Finnish as primary language; basic, upper secondary, bachelor and master or higher to the highest earned educational degree; urban, semi-urban and rural area to type of municipality of residence; Metropolitan area to area consisting of Helsinki, Espoo, Vantaa and Kauniainen.

Table B5. Attrition analysis

	(1) Quit survey	(2) Quit survey after treatment
Ref.: Treatment CONTROL		
Treatment EDUCATION	0.050	-0.055
	(0.197)	(0.322)
Treatment OCCUPATION	0.227	0.132
	(0.190)	(0.304)
Treatment MUNICIPALITY	0.537**	0.494
	(0.180)	(0.285)
Treatment AGE	0.081	0.201
	(0.196)	(0.301)
Treatment NATIONAL	-0.095	-0.206
	(0.206)	(0.336)
Treatment CHOICE	0.211	0.134
	(0.164)	(0.261)
Female	0.397***	0.778***
	(0.097)	(0.163)
Self-employed	0.409*	0.173
	(0.176)	(0.307)
Metropolitan area	0.182	0.269
	(0.106)	(0.168)
Disposable income (log)	-0.088	-0.120
	(0.121)	(0.197)
Ref.: Basic education		
Upper secondary	-0.217	-0.419
	(0.266)	(0.406)
Bachelor education	-0.194	-0.366
	(0.271)	(0.413)
Master or higher education	-0.398	-0.859
	(0.284)	(0.444)
Constant	-1.774	-2.470
	(1.277)	(2.069)
Observations	6642	6642

Notes: Logit regression using data on all respondents who started completing the survey (full survey sample). Dependent variable is 1 if respondent quit the survey before completion (column 1), and quit the survey before completion after treatment (column 2), and 0 otherwise. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table B6. Match between survey responses and register data

	Share
Year of birth	0.99
Gender	0.99
Municipality of residence	0.89
Occupational group	0.74
Highest level of education	0.90
All match	0.6

Notes: Comparison of self-reported demographic information in the survey and information in Statistics Finland's registers for those who completed the survey (N = 6,121). All match refers to the share of individuals for whom all survey responses match the register data.

Table B7. Occupation code and description

Classification	Code	Description
01	01	Commissioned armed forces officers
02	02	Non-commissioned armed forces officers
1		**Managers**
	11	Chief executives, senior officials and legislators
	12	Administrative and commercial managers
	13	Production and specialised services managers
	14	Hospitality, retail and other services managers
2		**Professionals**
	21	Science and engineering professionals
	22	Health professionals
	23	Teaching professionals
	24	Business and administration professionals
	25	Information and communications technology professionals
	26	Legal, social and cultural professionals
3		**Technicians and associate professionals**
	31	Science and engineering associate professionals
	32	Health associate professionals
	33	Business and administration associate professionals
	34	Legal, social, cultural and related associate professionals
	35	Information and communications technicians
4		**Clerical support workers**
	41	General and keyboard clerks
	42	Customer services clerks
	43	Numerical and material recording clerks
	44	Other clerical support workers
5		**Service and sales workers**
	51	Personal service workers
	52	Sales workers
	53	Personal care workers
	54	Protective services workers
6		**Skilled angricultural, forestry and fishery workers**
	61	Market-oriented skilled agricultural workers
	62	Market-oriented skilled forestry, fishery and hunting workers
7		**Craft and related trades workers**
	71	Building and related trades workers, excluding electricians
	72	Metal, machinery and related trades workers
	73	Handicraft and printing workers
	74	Electrical and electronic trades workers
	75	Food processing, wood working, garment and other craft and related trades workers
8		**Plant and machine operators, and assemblers**
	81	Stationary plant and machine operators
	82	Assemblers
	83	Drivers and mobile plant operators
9		**Elementary occupations**
	91	Cleaners and helpers
	92	Agricultural, forestry and fishery labourers
	93	Labourers in mining, construction, manufacturing and transport
	94	Food preparation assistants
	96	Refuse workers and other elementary workers

Table B8. Description of variables used in main specification

Variable	Description
(A) Outcome variables	
Fairness of own income	Q: How would you evaluate the fairness of the level of your disposable income? A: Unfairly low - Fair - Unfairly high. (slider, values 0-100, recoded as unfair - fair: abs([answer] - 50)
Satisfaction with disposable income	Q: How do you feel about your disposable income? A: Disappointed - Neither disappointed nor pleased - Pleased (slider, values 0-100)
Life satisfaction	Q: All things considered, how satisfied are you with your life as a whole nowadays? A: Extremely unsatisfied - Extremely satisfied (slider, values 0-100)
Job satisfaction	Q: How satisfied are you with your job in general? A: Not at all satisfied - Very satisfied (slider, values 0-100)
Wage satisfaction	Q: How satisfied are you with how much you earn on your current job? A: Not at all satisfied - Very satisfied (slider, values 0-100)
Job meaningfulness	Q: Does your work feel meaningful to you? A: Not at all meaningful - Very meaningful (slider, values 0-100)
Job search intentions	Q: How likely is it that you will search for a new job in the next six months? A: Very unlikely - Somewhat unlikely - Somewhat likely - Very likely (radio buttons)
(B) Treatment variables	
Treatment	Treatment indicator: CONTROL, AGE, MUNICIPALITY, EDUCATION, OCCUPATION, NATIONAL. Treatment assignment conducted by SF before start of data collection.
Misperception	Defined as Perceived rank - Actual rank (percentile / 100). Perceived rank from survey Block 3 (see Appendix D and E), Actual rank from SF register data.
(C) Covariates	
Female	Indicator variable, 1 if Female. Source SF register data.
High education	Indicator variable, 1 if highest level of education is Master or higher. Source SF register data.
Spouse	Indicator variable, 1 if reports living with a spouse. Source: survey data.
Child(ren)	Indicator variable, 1 if reports living with a child /children. Source: survey data.
Metropolitan area	Indicator variable, 1 if municipality of residence is Helsinki, Espoo, Vantaa, Kauniainen. Source: SF register data.

Notes: This table presents the variables used in the main analyses of this paper. The outcome variables with slider answer modes use continuous rating scales (Visual analogue scale, VAS) with labeled end points (and midpoints in Fairness of own income, Satisfaction with disposable income). The continuous scales are coded 0-100. All the analyses in this paper use standardized outcome measures.

B.2 Descriptive results

Table B9. Summary of misperceptions and absolute misperceptions in reference groups

	mean	sd	median	min	max
Misperceptions					
National	-21.6	18.0	-21	-86	89
Education	-19.9	22.3	-19	-89	86
Occupation	-13.2	26.1	-12	-97	79
Municipality	-21.5	18.7	-21	-88	91
Age	-12.9	19.3	-12	-83	79
Absolute misperceptions					
National	23.6	15.4	22	0	89
Education	24.2	17.5	21	0	89
Occupation	23.0	18.0	19	0	97
Municipality	23.7	15.8	22	0	91
Age	18.2	14.4	15	0	83

Notes: Summary statistics of misperceptions and absolute misperceptions about rank in the income distribution in reference groups. Misperception is defined as prior belief - actual rank and expressed in percentiles. The table uses data from the full survey sample.

Table B10. Correlates of well-being measures

	(1) Satisfaction with income	(2) Fairness	(3) Wage satisfaction	(4) Life satisfaction	(5) Job satisfaction	(6) Meaningfulness of job
Female	-0.10	-0.28***	0.072	0.21**	0.18*	0.49***
	(0.076)	(0.082)	(0.077)	(0.076)	(0.079)	(0.077)
Age	-0.012	0.0038	-0.010	-0.012	0.013	0.013
	(0.011)	(0.012)	(0.011)	(0.011)	(0.012)	(0.012)
Spouse	0.30**	0.33**	0.15	0.53***	0.16	0.15
	(0.096)	(0.10)	(0.092)	(0.10)	(0.099)	(0.094)
Child(ren)	-0.17	-0.083	-0.13	0.0063	0.017	0.14
	(0.093)	(0.094)	(0.088)	(0.091)	(0.095)	(0.091)
High education	0.24**	0.28**	0.22*	0.17*	0.16	0.12
	(0.090)	(0.088)	(0.094)	(0.082)	(0.094)	(0.098)
Metropolitan area	0.23**	0.11	0.057	0.13	0.031	0.036
	(0.086)	(0.085)	(0.086)	(0.083)	(0.093)	(0.094)
Disposable income (log)	0.94***	0.45***	0.88***	0.46***	0.093	0.10
	(0.13)	(0.13)	(0.13)	(0.13)	(0.11)	(0.11)
Constant	-9.55***	-5.13***	-8.89***	-4.91***	-1.72	-2.06
	(1.39)	(1.33)	(1.32)	(1.35)	(1.22)	(1.18)
Observations	772	772	718	772	718	718

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses using data from the baseline treatment CONTROL. Dependent variables are standardized. All covariates are binary variables except for Age and Disposable income (log).

B.3 Results: Causal effects

Table B11. OLS results for the effect of income rank information on satisfaction with disposable income (subsample: positive and negative surprise)

	Belief < Position					Belief > Position				
	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National	(6) Age	(7) Municipality	(8) Education	(9) Occupation	(10) National
Misperception	0.295	1.038***	0.730**	0.265	0.711**	2.376***	1.399	1.181	1.070	0.106
	(0.288)	(0.255)	(0.236)	(0.231)	(0.254)	(0.673)	(1.131)	(0.703)	(0.546)	(0.703)
Treatment	0.049	-0.120	-0.038	-0.004	0.032	0.289	0.334	-0.029	-0.052	0.212
	(0.093)	(0.096)	(0.096)	(0.105)	(0.101)	(0.149)	(0.250)	(0.197)	(0.144)	(0.274)
Misperception × Treatment	-0.480	-0.966**	-0.651*	-0.357	-0.361	-3.358***	-1.997	-1.727	-0.959	0.297
	(0.389)	(0.335)	(0.321)	(0.347)	(0.352)	(0.875)	(1.464)	(1.034)	(0.711)	(1.280)
Female	-0.195***	-0.125*	-0.182***	-0.200**	-0.210***	-0.297**	-0.344	-0.297*	-0.243**	-0.210
	(0.054)	(0.051)	(0.054)	(0.062)	(0.054)	(0.103)	(0.189)	(0.127)	(0.088)	(0.222)
High education	0.410***	0.275***	0.272***	0.352***	0.352***	0.389**	1.203***	0.391**	0.437***	0.690*
	(0.064)	(0.059)	(0.070)	(0.079)	(0.064)	(0.132)	(0.190)	(0.127)	(0.101)	(0.267)
Spouse	0.136	0.277***	0.198**	0.286***	0.205**	0.384**	-0.253	0.161	-0.175	0.005
	(0.073)	(0.064)	(0.070)	(0.081)	(0.069)	(0.141)	(0.262)	(0.181)	(0.118)	(0.273)
Child(ren)	-0.077	-0.046	0.061	-0.034	-0.025	-0.094	0.324	0.015	0.141	0.217
	(0.069)	(0.061)	(0.065)	(0.078)	(0.065)	(0.126)	(0.240)	(0.156)	(0.103)	(0.272)
Metropolitan area	0.247***	0.277***	0.311***	0.210**	0.242***	0.318*	0.169	0.251	0.472***	0.101
	(0.063)	(0.059)	(0.063)	(0.073)	(0.063)	(0.124)	(0.182)	(0.146)	(0.109)	(0.220)
Constant	-0.007	0.024	-0.068	-0.158	0.007	-0.635***	-0.234	-0.180	-0.201	-0.107
	(0.094)	(0.097)	(0.096)	(0.104)	(0.099)	(0.148)	(0.242)	(0.200)	(0.144)	(0.263)
Observations	1160	1356	1262	1036	1363	334	126	240	456	124

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the income satisfaction in the reference group. The dependent variable is how pleased/disappointed one feels with her disposable income, measured with a slider (0: Disappointed, 50: Neither disappointed nor pleased, 100: Pleased). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B12. OLS results for the effect of income rank information on fairness of own income - Fair/Unfairly high

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.22	0.31	0.49	0.25	0.24
	(0.28)	(0.30)	(0.25)	(0.21)	(0.29)
Treatment	0.070	-0.019	-0.11	0.081	-0.021
	(0.076)	(0.100)	(0.091)	(0.067)	(0.097)
Treatment × Misperception	-0.36	-0.91*	-0.79*	-0.27	-0.49
	(0.36)	(0.37)	(0.36)	(0.28)	(0.36)
Female	-0.14*	-0.18**	-0.27***	-0.26***	-0.10
	(0.065)	(0.069)	(0.069)	(0.065)	(0.071)
High education	0.19**	0.13	0.17*	0.18**	0.12
	(0.064)	(0.069)	(0.071)	(0.068)	(0.074)
Spouse	0.10	0.25**	0.20*	0.12	0.061
	(0.088)	(0.094)	(0.094)	(0.090)	(0.084)
Child(ren)	-0.035	-0.12	-0.13	-0.042	-0.13
	(0.075)	(0.076)	(0.077)	(0.077)	(0.075)
Metropolitan area	0.052	-0.022	0.10	-0.00021	-0.031
	(0.064)	(0.068)	(0.065)	(0.066)	(0.072)
Constant	-0.025	0.016	0.086	0.043	0.13
	(0.10)	(0.11)	(0.10)	(0.10)	(0.11)
Observations	850	807	819	791	830

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information on the perceived fairness of one's income relative to others in the reference group. The dependent variable is perceived fairness, measured with a slider (0: Unfairly low, 50: Fair, 100: Unfairly high) and recoded as 50 - abs(slider value - 50) to reflect range from Unfair to Fair. The regressions include the respondents who reported Fair to Unfairly high. The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

68

Table B13. OLS results for the effect of income rank information on fairness of own disposable income - Fair/Unfairly low

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	-0.083	0.33	0.43*	0.29	0.26
	(0.23)	(0.24)	(0.20)	(0.15)	(0.24)
Treatment	0.19**	0.047	-0.0042	-0.00055	0.16
	(0.067)	(0.092)	(0.075)	(0.065)	(0.090)
Treatment × Misperception	-0.22	-0.69*	-0.68**	-0.29	-0.044
	(0.30)	(0.33)	(0.26)	(0.23)	(0.34)
Female	-0.22***	-0.23***	-0.28***	-0.34***	-0.30***
	(0.056)	(0.056)	(0.057)	(0.059)	(0.059)
High education	0.35***	0.30***	0.26***	0.26***	0.31***
	(0.060)	(0.060)	(0.067)	(0.068)	(0.062)
Spouse	0.15*	0.19**	0.20**	0.19*	0.21**
	(0.070)	(0.074)	(0.075)	(0.078)	(0.078)
Child(ren)	-0.11	0.013	0.0047	0.020	0.052
	(0.064)	(0.067)	(0.066)	(0.071)	(0.070)
Metropolitan area	0.12*	0.12	0.24***	0.17*	0.12
	(0.063)	(0.065)	(0.063)	(0.067)	(0.065)
Constant	-0.044	-0.060	-0.033	-0.037	-0.083
	(0.083)	(0.095)	(0.090)	(0.084)	(0.098)
Observations	1088	1126	1101	1084	1080

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information on the perceived fairness of one's income relative to others in the reference group. The dependent variable is perceived fairness, measured with a slider (0: Unfairly low, 50: Fair, 100: Unfairly high) and recoded as 50 - abs(slider value - 50) to reflect range from Unfair to Fair. The regressions include the respondents who reported Unfairly low to Fair. The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B14. OLS results for the effect of income rank information on fairness of own income (subsample: positive and negative surprise)

	Belief < Position					Belief > Position				
	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National	(6) Age	(7) Municipality	(8) Education	(9) Occupation	(10) National
Misperception	0.264	0.621*	0.500*	0.531*	0.415	1.514*	1.599	0.725	0.881*	1.609*
	(0.295)	(0.261)	(0.249)	(0.235)	(0.258)	(0.690)	(1.031)	(0.633)	(0.423)	(0.766)
Treatment	0.094	0.020	0.023	0.129	0.018	0.375*	0.047	0.124	-0.067	0.487
	(0.091)	(0.091)	(0.093)	(0.098)	(0.100)	(0.151)	(0.296)	(0.208)	(0.140)	(0.263)
Misperception × Treatment	-0.443	-0.787*	-0.518	-0.112	-0.448	-1.491	-1.391	-1.630	0.185	-1.827
	(0.387)	(0.322)	(0.309)	(0.334)	(0.362)	(0.872)	(1.751)	(1.085)	(0.579)	(0.976)
Female	-0.150**	-0.197***	-0.267***	-0.294***	-0.220***	-0.353***	-0.212	-0.246	-0.298***	-0.298
	(0.054)	(0.051)	(0.054)	(0.058)	(0.054)	(0.104)	(0.216)	(0.128)	(0.090)	(0.210)
High education	0.280***	0.212***	0.224***	0.192**	0.217***	0.313*	0.305	0.202	0.246*	0.242
	(0.059)	(0.057)	(0.068)	(0.071)	(0.059)	(0.121)	(0.242)	(0.120)	(0.097)	(0.247)
Spouse	0.133	0.216***	0.219**	0.210**	0.188**	0.219	0.139	-0.008	0.052	-0.162
	(0.069)	(0.065)	(0.069)	(0.078)	(0.068)	(0.141)	(0.293)	(0.184)	(0.116)	(0.233)
Child(ren)	-0.104	-0.029	-0.078	0.020	0.001	0.033	0.227	0.248	0.013	0.121
	(0.064)	(0.059)	(0.062)	(0.072)	(0.062)	(0.117)	(0.277)	(0.156)	(0.103)	(0.228)
Metropolitan area	0.100	0.085	0.198***	0.083	0.067	0.127	0.008	0.199	0.194*	0.223
	(0.059)	(0.056)	(0.058)	(0.066)	(0.058)	(0.125)	(0.216)	(0.126)	(0.097)	(0.198)
Constant	0.043	0.059	0.037	0.043	0.014	-0.372*	-0.492	-0.140	-0.129	-0.162
	(0.093)	(0.095)	(0.094)	(0.108)	(0.097)	(0.164)	(0.306)	(0.222)	(0.134)	(0.287)
Observations	1160	1356	1262	1036	1363	334	126	240	456	124

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information on the perceived fairness of one's income relative to others in the reference group. The dependent variable is perceived fairness, measured with a slider (0: Unfairly low, 50: Fair, 100: Unfairly high) and recoded as 50 - abs(slider value - 50) to reflect range from Unfair to Fair. The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B15. OLS results for the effect of income rank information on wage satisfaction (subsample: positive and negative surprise)

	Belief < Position					Belief > Position				
	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National	(6) Age	(7) Municipality	(8) Education	(9) Occupation	(10) National
Misperception	0.202	0.637**	0.729**	0.429	0.353	1.319	-1.316	-0.212	-0.269	-0.360
	(0.277)	(0.242)	(0.227)	(0.235)	(0.255)	(0.824)	(1.342)	(0.923)	(0.542)	(1.117)
Treatment	0.117	0.087	-0.019	-0.081	0.288**	0.099	0.107	-0.310	-0.193	-0.106
	(0.099)	(0.101)	(0.100)	(0.107)	(0.103)	(0.182)	(0.281)	(0.222)	(0.157)	(0.289)
Treatment × Misbelief	-0.074	0.115	-0.688*	-0.384	0.656	-0.629	-1.308	0.925	0.683	0.701
	(0.397)	(0.337)	(0.311)	(0.333)	(0.355)	(1.165)	(1.749)	(1.233)	(0.743)	(1.373)
Female	-0.160**	-0.118*	-0.110*	-0.172**	-0.128*	-0.244*	-0.135	-0.186	-0.070	-0.170
	(0.059)	(0.055)	(0.056)	(0.064)	(0.055)	(0.120)	(0.205)	(0.152)	(0.102)	(0.221)
High education	0.419***	0.289***	0.342***	0.414***	0.364***	0.178	0.645*	0.253	0.242*	0.851**
	(0.070)	(0.066)	(0.075)	(0.081)	(0.067)	(0.159)	(0.268)	(0.154)	(0.123)	(0.304)
Spouse	0.090	0.184**	0.155*	0.247**	0.099	0.285	-0.442	-0.035	0.023	-0.014
	(0.074)	(0.070)	(0.072)	(0.080)	(0.069)	(0.155)	(0.262)	(0.201)	(0.132)	(0.280)
Child(ren)	-0.028	-0.034	0.044	-0.004	0.026	-0.099	0.423	0.099	0.046	-0.181
	(0.071)	(0.065)	(0.067)	(0.078)	(0.065)	(0.139)	(0.232)	(0.178)	(0.121)	(0.259)
Metropolitan area	0.135*	0.215***	0.209**	0.081	0.133*	0.168	-0.188	0.064	0.371**	0.054
	(0.067)	(0.065)	(0.065)	(0.075)	(0.064)	(0.154)	(0.219)	(0.183)	(0.119)	(0.283)
Constant	-0.035	-0.016	-0.038	-0.074	-0.066	-0.358	0.279	0.062	-0.169	0.261
	(0.095)	(0.096)	(0.098)	(0.106)	(0.097)	(0.182)	(0.286)	(0.240)	(0.156)	(0.299)
Observations	1090	1270	1178	969	1276	296	111	206	418	107

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the wage satisfaction in the reference group. The dependent variable is how satisfied one feels with how much she earns in the current job, measured with a slider (0: Not at all satisfied, 100: Very satisfied). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B16. OLS results for the effect of income rank information on life satisfaction (subsample: positive and negative surprise)

	Belief < Position					Belief > Position				
	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National	(6) Age	(7) Municipality	(8) Education	(9) Occupation	(10) National
Misperception	0.201	0.335	0.470*	0.232	0.497*	2.343**	1.266	0.632	0.476	2.084*
	(0.267)	(0.236)	(0.220)	(0.219)	(0.234)	(0.774)	(0.978)	(0.785)	(0.495)	(1.019)
Treatment	0.001	0.001	-0.021	-0.029	0.000	0.290	0.216	0.019	0.110	0.437
	(0.094)	(0.098)	(0.097)	(0.099)	(0.096)	(0.170)	(0.229)	(0.190)	(0.148)	(0.265)
Misperception × Treatment	-0.226	-0.100	-0.246	-0.382	-0.250	-2.237*	-1.547	-0.516	-1.065	-1.587
	(0.378)	(0.327)	(0.304)	(0.308)	(0.329)	(1.105)	(1.371)	(1.000)	(0.691)	(1.265)
Female	0.045	0.062	0.041	0.131*	0.056	-0.128	0.170	-0.051	0.214*	0.277
	(0.056)	(0.053)	(0.054)	(0.060)	(0.051)	(0.112)	(0.164)	(0.131)	(0.094)	(0.200)
High education	0.245***	0.231***	0.187*	0.233**	0.193**	0.128	0.402	0.251	0.176	0.355
	(0.067)	(0.064)	(0.073)	(0.075)	(0.062)	(0.152)	(0.222)	(0.133)	(0.117)	(0.285)
Spouse	0.425***	0.395***	0.522***	0.423***	0.433***	0.642***	0.383	0.372*	0.378**	0.504
	(0.071)	(0.068)	(0.070)	(0.074)	(0.064)	(0.145)	(0.210)	(0.171)	(0.124)	(0.258)
Child(ren)	0.068	0.112	0.162*	0.146*	0.162**	0.196	0.141	0.217	0.125	-0.044
	(0.068)	(0.064)	(0.066)	(0.072)	(0.061)	(0.130)	(0.182)	(0.155)	(0.114)	(0.237)
Metropolitan area	0.165**	0.159*	0.158*	0.132	0.071	0.249	0.261	0.230	0.229*	0.097
	(0.063)	(0.063)	(0.063)	(0.068)	(0.059)	(0.143)	(0.173)	(0.155)	(0.112)	(0.246)
Constant	-0.441***	-0.431***	-0.506***	-0.518***	-0.402***	-0.953***	-0.561*	-0.489*	-0.639***	-0.944***
	(0.091)	(0.093)	(0.096)	(0.097)	(0.090)	(0.169)	(0.235)	(0.203)	(0.146)	(0.278)
Observations	1160	1356	1262	1036	1363	334	126	240	456	124

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the life satisfaction in the reference group. The dependent variable is life satisfaction (0: Extremely unsatisfied, 100: Extremely satisfied). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables include treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

72

Table B17. OLS results for the effect of income rank information on job satisfaction

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.228	-0.026	0.297	-0.031	0.029
	(0.199)	(0.224)	(0.187)	(0.162)	(0.222)
Treatment	-0.015	0.121	-0.035	0.004	0.023
	(0.063)	(0.085)	(0.074)	(0.061)	(0.084)
Treatment × Misperception	0.208	0.372	-0.246	0.079	0.009
	(0.290)	(0.300)	(0.258)	(0.216)	(0.303)
Female	0.098	0.123*	0.024	0.078	0.054
	(0.054)	(0.054)	(0.055)	(0.055)	(0.055)
High education	0.114	0.205**	0.123	0.170**	0.183**
	(0.066)	(0.064)	(0.067)	(0.065)	(0.065)
Spouse	0.072	0.063	0.116	0.141*	0.163*
	(0.072)	(0.070)	(0.073)	(0.069)	(0.072)
Child(ren)	0.115	0.110	0.142*	0.089	0.098
	(0.068)	(0.065)	(0.068)	(0.066)	(0.069)
Metropolitan area	0.123	0.038	0.117	0.047	-0.017
	(0.064)	(0.065)	(0.063)	(0.063)	(0.064)
Constant	-0.204**	-0.243**	-0.192*	-0.258***	-0.247**
	(0.077)	(0.090)	(0.086)	(0.077)	(0.087)
ATE: positive surprise	-0.070	0.012	0.044	-0.021	0.021
	(0.069)	(0.057)	(0.062)	(0.066)	(0.058)
ATE: negative surprise	0.029	0.204	-0.092	0.024	0.026
	(0.109)	(0.144)	(0.123)	(0.098)	(0.148)
Observations	1413	1398	1400	1400	1393

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the job satisfaction in the reference group. The dependent variable is job satisfaction (0: Extremely unsatisfied, 100: Extremely satisfied). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers. The average treatment effect, ATE, is computed by multiplying the mean of misperceptions with the coefficient of Treatment×Misperception plus the coefficient of Treatment. The mean values are calculated from the misperceptions that are absolutely larger than 10 percentage points.

Table B18. OLS results for the effect of income rank information on job satisfaction (subsample: positive and negative surprise)

	Belief < Position					Belief > Position				
	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National	(6) Age	(7) Municipality	(8) Education	(9) Occupation	(10) National
Misperception	-0.156	-0.203	0.315	-0.086	-0.119	0.343	0.024	-0.313	-0.201	1.442
	(0.297)	(0.249)	(0.240)	(0.238)	(0.262)	(0.772)	(1.497)	(0.852)	(0.535)	(1.007)
Treatment	-0.026	0.197	-0.038	0.013	0.103	-0.058	0.050	-0.125	-0.004	0.051
	(0.106)	(0.104)	(0.106)	(0.108)	(0.107)	(0.170)	(0.313)	(0.205)	(0.155)	(0.260)
Treatment × Misbelief	0.139	0.610	-0.254	0.090	0.290	0.608	0.017	0.281	0.183	-1.285
	(0.425)	(0.346)	(0.329)	(0.336)	(0.365)	(1.092)	(1.951)	(1.138)	(0.734)	(1.238)
Female	0.098	0.136*	0.051	0.068	0.075	-0.004	-0.081	-0.158	0.118	-0.237
	(0.063)	(0.057)	(0.060)	(0.065)	(0.057)	(0.112)	(0.229)	(0.141)	(0.100)	(0.199)
High education	0.144	0.185**	0.158*	0.223**	0.168*	0.008	0.437	-0.041	0.058	0.287
	(0.075)	(0.068)	(0.079)	(0.082)	(0.069)	(0.149)	(0.298)	(0.142)	(0.121)	(0.274)
Spouse	0.039	0.072	0.137	0.134	0.156*	0.151	-0.031	-0.068	0.156	0.308
	(0.080)	(0.072)	(0.076)	(0.081)	(0.071)	(0.145)	(0.292)	(0.185)	(0.130)	(0.252)
Child(ren)	0.119	0.103	0.180*	0.071	0.095	0.082	0.246	-0.070	0.120	0.191
	(0.076)	(0.067)	(0.071)	(0.078)	(0.067)	(0.131)	(0.259)	(0.165)	(0.120)	(0.234)
Metropolitan area	0.132	0.078	0.107	0.040	0.002	0.130	-0.352	0.160	0.040	-0.298
	(0.071)	(0.067)	(0.069)	(0.076)	(0.066)	(0.144)	(0.244)	(0.169)	(0.118)	(0.255)
Constant	-0.299**	-0.314**	-0.247*	-0.266*	-0.291**	-0.128	-0.005	0.321	-0.244	-0.357
	(0.102)	(0.099)	(0.104)	(0.107)	(0.100)	(0.171)	(0.319)	(0.221)	(0.154)	(0.270)
Observations	1090	1270	1178	969	1276	296	111	206	418	107

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the job satisfaction in the reference group. The dependent variable is job satisfaction (0: Extremely unsatisfied, 100: Extremely satisfied). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B19. OLS results for the effect of income rank information on job meaningfulness

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.082	0.109	0.261	-0.135	0.114
	(0.182)	(0.206)	(0.170)	(0.143)	(0.209)
Treatment	0.008	0.071	-0.051	-0.053	0.010
	(0.062)	(0.084)	(0.072)	(0.061)	(0.084)
Treatment × Misperception	0.172	0.136	-0.123	-0.131	0.042
	(0.278)	(0.294)	(0.239)	(0.203)	(0.297)
Female	0.354***	0.335***	0.263***	0.354***	0.322***
	(0.052)	(0.054)	(0.053)	(0.055)	(0.054)
High education	0.146*	0.234***	0.130	0.204**	0.170**
	(0.065)	(0.063)	(0.068)	(0.066)	(0.066)
Spouse	0.081	0.073	0.163*	0.140*	0.139*
	(0.069)	(0.071)	(0.072)	(0.069)	(0.069)
Child(ren)	0.214**	0.171**	0.167*	0.167*	0.129
	(0.065)	(0.065)	(0.067)	(0.068)	(0.067)
Metropolitan area	0.088	0.025	0.080	-0.020	-0.064
	(0.063)	(0.065)	(0.064)	(0.065)	(0.066)
Constant	-0.420***	-0.365***	-0.356***	-0.447***	-0.343***
	(0.075)	(0.088)	(0.083)	(0.075)	(0.084)
ATE: positive surprise	0.023	0.018	0.004	0.000	-0.002
	(0.019)	(0.017)	(0.018)	(0.019)	(0.016)
ATE: negative surprise	0.004	-0.018	0.034	0.018	0.004
	(0.031)	(0.038)	(0.030)	(0.026)	(0.038)
Observations	1413	1398	1400	1400	1393

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the job meaningfulness in the reference group. The dependent variable is how meaningful one feels with her current job, measured with a slider (0: Not at all meaningful, 100: Very meaningful). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables include treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers. The average treatment effect, ATE, is computed by multiplying the mean of misperceptions with the coefficient of Treatment×Misperception plus the coefficient of Treatment. The mean values are calculated from the misperceptions that are absolutely larger than 10 percentage points.

Table B20. OLS results for the effect of income rank information on job meaningfulness (subsample: positive and negative surprise)

	Belief < Position					Belief > Position				
	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National	(6) Age	(7) Municipality	(8) Education	(9) Occupation	(10) National
Misperception	-0.488	-0.123	0.192	-0.166	-0.103	0.719	1.872	0.607	0.375	0.985
	(0.299)	(0.249)	(0.232)	(0.243)	(0.273)	(0.681)	(1.539)	(0.864)	(0.487)	(1.344)
Treatment	0.162	0.167	-0.127	-0.146	0.090	-0.074	0.070	0.091	0.097	-0.144
	(0.104)	(0.103)	(0.101)	(0.110)	(0.110)	(0.168)	(0.289)	(0.217)	(0.150)	(0.283)
Misperception × Treatment	0.757	0.447	-0.315	-0.405	0.306	-0.348	-1.638	-0.604	-0.556	-0.363
	(0.431)	(0.347)	(0.319)	(0.332)	(0.380)	(1.092)	(1.767)	(1.260)	(0.733)	(1.560)
Female	0.353***	0.351***	0.266***	0.308***	0.327***	0.311**	0.191	0.195	0.481***	0.168
	(0.061)	(0.057)	(0.058)	(0.065)	(0.057)	(0.112)	(0.232)	(0.142)	(0.104)	(0.209)
High education	0.168*	0.223***	0.232**	0.159	0.178**	0.075	0.352	-0.181	0.294*	0.057
	(0.074)	(0.065)	(0.077)	(0.081)	(0.068)	(0.150)	(0.286)	(0.150)	(0.124)	(0.320)
Spouse	0.078	0.070	0.227**	0.074	0.110	0.094	0.171	-0.100	0.312*	0.589*
	(0.079)	(0.074)	(0.077)	(0.082)	(0.073)	(0.148)	(0.292)	(0.186)	(0.132)	(0.289)
Child(ren)	0.221**	0.165*	0.165*	0.187*	0.143*	0.138	0.267	0.166	0.104	0.032
	(0.077)	(0.068)	(0.073)	(0.082)	(0.071)	(0.133)	(0.268)	(0.176)	(0.123)	(0.243)
Metropolitan area	0.080	0.066	0.044	0.002	-0.046	0.137	-0.270	0.301	-0.116	-0.272
	(0.071)	(0.068)	(0.070)	(0.078)	(0.069)	(0.153)	(0.263)	(0.164)	(0.123)	(0.296)
Constant	-0.575***	-0.443***	-0.431***	-0.392***	-0.401***	-0.319*	-0.457	-0.099	-0.679***	-0.450
	(0.104)	(0.100)	(0.100)	(0.110)	(0.101)	(0.161)	(0.337)	(0.225)	(0.146)	(0.292)
Observations	1090	1270	1178	969	1276	296	111	206	418	107

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on job mearningfulness in the reference group. The dependent variable is how meaningful one feels with her current job, measured with a slider (0: Not at all meaningful, 100: Very meaningful). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B21. Marginal effect of income rank information on the likelihood of searching for a new job

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.046	0.085	0.056	-0.003	0.033
	(0.058)	(0.057)	(0.049)	(0.042)	(0.058)
Treatment	0.012	-0.002	0.021	0.011	0.001
	(0.018)	(0.022)	(0.019)	(0.017)	(0.022)
Treatment × Misperception	-0.039	-0.068	0.054	0.032	0.010
	(0.081)	(0.080)	(0.065)	(0.058)	(0.078)
Female	0.051**	0.030*	0.042**	0.035*	0.036*
	(0.016)	(0.015)	(0.016)	(0.016)	(0.015)
High education	-0.023	-0.047*	-0.032	-0.022	-0.001
	(0.020)	(0.021)	(0.020)	(0.020)	(0.018)
Spouse	-0.029	-0.004	-0.027	0.026	-0.015
	(0.018)	(0.019)	(0.019)	(0.020)	(0.018)
Child(ren)	-0.020	-0.021	-0.002	-0.034	-0.027
	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)
Metropolitan area	0.017	0.019	0.006	0.011	0.016
	(0.017)	(0.018)	(0.018)	(0.017)	(0.017)
ATE: positive surprise	0.023	0.018	0.004	0.000	-0.002
	(0.019)	(0.017)	(0.018)	(0.019)	(0.016)
ATE: negative surprise	0.004	-0.018	0.034	0.018	0.004
	(0.031)	(0.038)	(0.030)	(0.026)	(0.038)
Observations	1521	1501	1519	1505	1498

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Logit regression estimating the effects of income rank information provision on the likelihood of searching for a new in the next six months in the reference group. The dependent variable is a dummy that indicates that a participant is very likely to search for a new job. The control variables include treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers. The average treatment effect, ATE, is computed by multiplying the mean of misperceptions with the coefficient of Treatment×Misperception plus the coefficient of Treatment. The mean values are calculated from the misperceptions that are absolutely larger than 10 percentage points.

Table B22. Marginal effects on the likelihood of searching for a new job (subsample: positive and negative surprise)

	Belief < Position					Belief > Position				
	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National	(6) Age	(7) Municipality	(8) Education	(9) Occupation	(10) National
Misperception	-0.011 (0.086)	-0.002 (0.074)	-0.019 (0.066)	-0.011 (0.066)	-0.032 (0.070)	0.085 (0.243)	-0.086 (0.430)	0.374 (0.259)	0.095 (0.163)	0.285 (0.294)
Treatment	0.027 (0.030)	0.023 (0.030)	0.027 (0.029)	-0.027 (0.031)	0.007 (0.029)	0.053 (0.054)	-0.146 (0.107)	0.083 (0.070)	0.051 (0.047)	0.097 (0.089)
Misperception × Treatment	0.037 (0.120)	0.012 (0.099)	0.079 (0.092)	-0.067 (0.091)	0.040 (0.099)	-0.399 (0.385)	0.364 (0.599)	-0.258 (0.321)	-0.046 (0.211)	-0.698 (0.476)
Female	0.056** (0.018)	0.028 (0.016)	0.032 (0.016)	0.019 (0.018)	0.034* (0.016)	0.032 (0.036)	0.007 (0.078)	0.082 (0.048)	0.070* (0.030)	0.036 (0.069)
High education	-0.009 (0.021)	-0.027 (0.021)	-0.006 (0.022)	-0.026 (0.024)	0.001 (0.019)	-0.091 (0.064)	0.000 (.)	-0.113* (0.052)	-0.015 (0.038)	0.036 (0.084)
Spouse	-0.017 (0.021)	-0.009 (0.020)	-0.026 (0.020)	0.033 (0.023)	-0.006 (0.018)	-0.070 (0.043)	0.087 (0.107)	-0.019 (0.060)	0.012 (0.039)	-0.126 (0.078)
Child(ren)	-0.042* (0.020)	-0.025 (0.018)	-0.016 (0.019)	-0.037 (0.021)	-0.036* (0.018)	0.066 (0.044)	0.030 (0.087)	0.068 (0.056)	-0.026 (0.035)	0.060 (0.083)
Metropolitan area	0.021 (0.019)	0.008 (0.019)	0.005 (0.019)	0.034 (0.020)	0.013 (0.017)	0.009 (0.046)	0.112 (0.076)	0.012 (0.054)	-0.060 (0.040)	0.091 (0.070)
Observations	1160	1356	1262	1036	1363	334	106	240	456	124

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Logit regression estimating the effects of income rank information provision on the likelihood of searching for a new in the next six months. The dependent variable is a dummy that indicates that a participant is very likely to search for a new job. The control variables used in the analysis are treatment, misperception about the income rank in the reference group corresponding to the treatment, and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

B.4 Results: Asymmetry of effects

Table B23. Linear spline results for the effect of income rank information on satisfaction with disposable income (symmetry of effect)

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.051	0.678***	0.587***	0.223	0.495*
	(0.189)	(0.201)	(0.165)	(0.138)	(0.202)
Treatment	0.076	-0.013	-0.037	-0.068	0.109
	(0.066)	(0.080)	(0.075)	(0.070)	(0.086)
Treatment × Misperception	-0.424	-0.639*	-0.639*	-0.545*	-0.116
	(0.301)	(0.289)	(0.262)	(0.264)	(0.306)
Treatment × Misperception$^+$	-1.502*	-0.809	-1.035	-0.168	0.201
	(0.606)	(0.741)	(0.653)	(0.493)	(0.859)
Female	-0.214***	-0.152**	-0.203***	-0.226***	-0.211***
	(0.048)	(0.049)	(0.049)	(0.050)	(0.052)
High education	0.416***	0.357***	0.303***	0.374***	0.386***
	(0.057)	(0.056)	(0.060)	(0.062)	(0.061)
Spouse	0.203**	0.234***	0.202**	0.162*	0.198**
	(0.064)	(0.063)	(0.065)	(0.067)	(0.066)
Child(ren)	-0.078	-0.018	0.055	0.009	-0.008
	(0.059)	(0.059)	(0.060)	(0.063)	(0.063)
Metropolitan area	0.279***	0.266***	0.302***	0.284***	0.236***
	(0.055)	(0.056)	(0.057)	(0.060)	(0.060)
Constant	-0.144*	-0.082	-0.111	-0.137	-0.071
	(0.069)	(0.079)	(0.074)	(0.070)	(0.084)
Observations	1521	1501	1519	1505	1498

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the income satisfaction in the reference group. The dependent variable is how pleased/disappointed one feels with her disposable income, measured with a slider (0: Disappointed, 50: Neither disappointed nor pleased, 100: Pleased). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables include treatment, misperception about the income rank in the reference group corresponding to the treatment, a piecewise function of misperception (Misperception$^+$ equals the value if the misperception is positive, otherwise zero), and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B24. Linear spline results for the effect of income rank information on fairness of own income (symmetry of effect)

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.036	0.337	0.446**	0.285*	0.266
	(0.193)	(0.205)	(0.169)	(0.133)	(0.207)
Treatment	0.154*	0.046	0.033	0.051	0.080
	(0.066)	(0.081)	(0.073)	(0.067)	(0.084)
Treatment × Misperception	-0.262	-0.700*	-0.488*	-0.291	-0.270
	(0.299)	(0.286)	(0.248)	(0.253)	(0.310)
Treatment × Misperception$^+$	-0.031	-0.973	-0.916	0.025	0.053
	(0.558)	(1.423)	(0.695)	(0.456)	(0.600)
Female	-0.193***	-0.200***	-0.273***	-0.310***	-0.232***
	(0.048)	(0.049)	(0.049)	(0.049)	(0.052)
High education	0.288***	0.238***	0.215***	0.214***	0.237***
	(0.051)	(0.054)	(0.057)	(0.057)	(0.056)
Spouse	0.151*	0.215***	0.192**	0.173**	0.165*
	(0.061)	(0.065)	(0.065)	(0.065)	(0.064)
Child(ren)	-0.073	-0.004	-0.020	0.007	0.007
	(0.055)	(0.059)	(0.057)	(0.059)	(0.059)
Metropolitan area	0.112*	0.068	0.198***	0.123*	0.085
	(0.052)	(0.055)	(0.052)	(0.054)	(0.055)
Constant	-0.052	-0.054	-0.000	-0.020	-0.029
	(0.071)	(0.081)	(0.075)	(0.071)	(0.083)
Observations	1521	1501	1519	1505	1498

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information on the perceived fairness of one's income relative to others in the reference group. The dependent variable is perceived fairness, measured with a slider (0: Unfairly low, 50: Fair, 100: Unfairly high) and recoded as 50 - abs(slider value - 50) to reflect range from Unfair to Fair. The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables include treatment, misperception about the income rank in the reference group corresponding to the treatment, a piecewise function of misperception (Misperception$^+$ equals the value if the misperception is positive, otherwise zero), and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B25. Linear spline results for the effect of income rank information on wage satisfaction (symmetry of effect)

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.025	0.471*	0.484*	0.029	0.309
	(0.200)	(0.219)	(0.188)	(0.166)	(0.224)
Treatment	0.093	0.141	-0.011	-0.043	0.239**
	(0.074)	(0.088)	(0.084)	(0.075)	(0.092)
Treatment × Misperception	-0.169	0.288	-0.629*	-0.206	0.525
	(0.315)	(0.313)	(0.279)	(0.276)	(0.335)
Treatment × Misperception$^+$	-0.207	-3.234***	-0.435	-0.001	-0.977
	(0.721)	(0.867)	(0.891)	(0.515)	(0.765)
Female	-0.188***	-0.112*	-0.128*	-0.143**	-0.126*
	(0.053)	(0.053)	(0.054)	(0.055)	(0.055)
High education	0.397***	0.318***	0.325***	0.371***	0.399***
	(0.063)	(0.064)	(0.065)	(0.068)	(0.064)
Spouse	0.134*	0.121	0.139*	0.201**	0.093
	(0.067)	(0.067)	(0.068)	(0.069)	(0.067)
Child(ren)	-0.020	-0.004	0.057	-0.010	0.015
	(0.063)	(0.063)	(0.063)	(0.065)	(0.064)
Metropolitan area	0.167**	0.176**	0.199***	0.179**	0.133*
	(0.060)	(0.061)	(0.060)	(0.065)	(0.061)
Constant	-0.123	-0.042	-0.103	-0.199**	-0.072
	(0.070)	(0.085)	(0.083)	(0.073)	(0.086)
Observations	1413	1398	1400	1400	1393

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the wage satisfaction in the reference group. The dependent variable is how satisfied one feels with how much she earns in the current job, measured with a slider (0: Not at all satisfied, 100: Very satisfied). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables include treatment, misperception about the income rank in the reference group corresponding to the treatment, a piecewise function of misperception (Misperception$^+$ equals the value if the misperception is positive, otherwise zero), and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B26. Linear spline results for the effect of income rank information on life satisfaction (symmetry of effect)

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.216	0.442*	0.422*	0.154	0.363
	(0.183)	(0.189)	(0.166)	(0.140)	(0.194)
Treatment	0.001	-0.003	-0.010	0.006	0.032
	(0.068)	(0.079)	(0.076)	(0.068)	(0.084)
Treatment $\times$ Misperception	-0.281	-0.129	-0.216	-0.284	-0.160
	(0.292)	(0.279)	(0.257)	(0.225)	(0.302)
Treatment $\times$ Misperception^{+}	-0.024	0.115	-0.193	-0.390	0.257
	(0.716)	(1.021)	(0.707)	(0.475)	(0.578)
Female	0.017	0.085	0.019	0.159**	0.068
	(0.049)	(0.050)	(0.050)	(0.050)	(0.050)
High education	0.224***	0.233***	0.211***	0.213***	0.214***
	(0.056)	(0.055)	(0.058)	(0.054)	(0.055)
Spouse	0.472***	0.400***	0.500***	0.417***	0.447***
	(0.070)	(0.069)	(0.071)	(0.068)	(0.067)
Child(ren)	0.110	0.114	0.174**	0.135*	0.144*
	(0.061)	(0.060)	(0.061)	(0.061)	(0.060)
Metropolitan area	0.174**	0.171**	0.154**	0.165**	0.073
	(0.055)	(0.057)	(0.055)	(0.056)	(0.056)
Constant	-0.505***	-0.419***	-0.507***	-0.555***	-0.458***
	(0.079)	(0.086)	(0.084)	(0.077)	(0.089)
Observations	1521	1501	1519	1505	1498

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the wage satisfaction in the reference group. The dependent variable is life satisfaction (0: Extremely unsatisfied, 100: Extremely satisfied). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables include treatment, misperception about the income rank in the reference group corresponding to the treatment, a piecewise function of misperception (Misperception^{+} equals the value if the misperception is positive, otherwise zero), and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B27. Linear spline results for the effect of income rank information on job satisfaction (symmetry of effect)

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.227	-0.024	0.298	-0.031	0.030
	(0.199)	(0.224)	(0.187)	(0.162)	(0.222)
Treatment	-0.075	0.139	-0.015	-0.004	0.042
	(0.077)	(0.088)	(0.085)	(0.075)	(0.093)
Treatment × Misperception	-0.054	0.434	-0.181	0.051	0.075
	(0.354)	(0.311)	(0.291)	(0.256)	(0.340)
Treatment × Misperception$^+$	1.137	-0.521	-0.343	0.098	-0.327
	(0.724)	(0.969)	(0.923)	(0.545)	(0.752)
Female	0.095	0.127*	0.026	0.077	0.056
	(0.054)	(0.054)	(0.055)	(0.055)	(0.055)
High education	0.117	0.201**	0.121	0.170**	0.180**
	(0.066)	(0.064)	(0.067)	(0.065)	(0.065)
Spouse	0.071	0.063	0.115	0.141*	0.162*
	(0.072)	(0.070)	(0.073)	(0.069)	(0.072)
Child(ren)	0.113	0.110	0.141*	0.089	0.098
	(0.068)	(0.065)	(0.068)	(0.066)	(0.069)
Metropolitan area	0.120	0.037	0.117	0.047	-0.017
	(0.064)	(0.065)	(0.063)	(0.064)	(0.064)
Constant	-0.201**	-0.243**	-0.191*	-0.258***	-0.246**
	(0.077)	(0.090)	(0.086)	(0.077)	(0.087)
Observations	1413	1398	1400	1400	1393

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the wage satisfaction in the reference group. The dependent variable is job satisfaction (0: Extremely unsatisfied, 100: Extremely satisfied). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables include treatment, misperception about the income rank in the reference group corresponding to the treatment, a piecewise function of misperception (Misperception$^+$ equals the value if the misperception is positive, otherwise zero), and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B28. Linear spline results for the effect of income rank information on job meaningfulness (symmetry of effect)

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.083	0.112	0.260	-0.136	0.113
	(0.182)	(0.206)	(0.170)	(0.143)	(0.209)
Treatment	0.014	0.091	-0.070	-0.122	0.000
	(0.073)	(0.088)	(0.082)	(0.077)	(0.093)
Treatment × Misperception	0.196	0.207	-0.183	-0.365	0.005
	(0.333)	(0.308)	(0.267)	(0.249)	(0.326)
Treatment × Misperception^{+}	-0.107	-0.588	0.315	0.790	0.180
	(0.764)	(0.973)	(0.778)	(0.570)	(0.815)
Female	0.354***	0.339***	0.260***	0.352***	0.321***
	(0.052)	(0.054)	(0.053)	(0.055)	(0.055)
High education	0.146*	0.230***	0.131	0.208**	0.172**
	(0.065)	(0.063)	(0.068)	(0.066)	(0.066)
Spouse	0.081	0.073	0.163*	0.141*	0.140*
	(0.069)	(0.071)	(0.072)	(0.069)	(0.069)
Child(ren)	0.214**	0.172**	0.167*	0.166*	0.129
	(0.065)	(0.065)	(0.067)	(0.068)	(0.067)
Metropolitan area	0.088	0.024	0.080	-0.026	-0.064
	(0.063)	(0.065)	(0.064)	(0.065)	(0.066)
Constant	-0.420***	-0.365***	-0.356***	-0.446***	-0.343***
	(0.075)	(0.088)	(0.083)	(0.075)	(0.084)
Observations	1413	1398	1400	1400	1393

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OLS regressions with robust standard errors in parentheses estimating the effects of income rank information provision on the wage satisfaction in the reference group. The dependent variable is how meaningful one feels with her current job, measured with a slider (0: Not at all meaningful, 100: Very meaningful). The dependent variable is standardized by subtracting the control group mean from each observation and then dividing by the control group standard deviation. The control variables include treatment, misperception about the income rank in the reference group corresponding to the treatment, a piecewise function of misperception (Misperception^{+} equals the value if the misperception is positive, otherwise zero), and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B29. Linear spline marginal effects on the likelihood of searching for a new job (symmetry of effect)

	(1) Age	(2) Municipality	(3) Education	(4) Occupation	(5) National
Misperception	0.047	0.084	0.056	-0.004	0.033
	(0.057)	(0.057)	(0.049)	(0.042)	(0.058)
Treatment	0.023	-0.007	0.016	-0.007	0.008
	(0.021)	(0.025)	(0.023)	(0.021)	(0.025)
Treatment $\times$ Misperception	0.007	-0.085	0.036	-0.026	0.035
	(0.097)	(0.087)	(0.079)	(0.071)	(0.090)
Treatment $\times$ Misperception$^+$	-0.204	0.112	0.056	0.176	-0.110
	(0.234)	(0.226)	(0.140)	(0.131)	(0.199)
Female	0.051**	0.030	0.041**	0.034*	0.037*
	(0.016)	(0.016)	(0.016)	(0.016)	(0.015)
High education	-0.024	-0.046*	-0.032	-0.021	-0.002
	(0.020)	(0.021)	(0.020)	(0.020)	(0.018)
Spouse	-0.029	-0.004	-0.027	0.026	-0.016
	(0.018)	(0.019)	(0.019)	(0.020)	(0.018)
Child(ren)	-0.020	-0.021	-0.002	-0.035	-0.027
	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)
Metropolitan area	0.017	0.020	0.006	0.010	0.016
	(0.017)	(0.018)	(0.018)	(0.017)	(0.017)
Observations	1521	1501	1519	1505	1498

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Logit regression estimating the effects of income rank information provision on the likelihood of searching for a new in the next six months in the reference group. The dependent variable is a dummy that indicates that a participant is very likely to search for a new job. The control variables include treatment, misperception about the income rank in the reference group corresponding to the treatment, a piecewise function of misperception (Misperception$^+$ equals the value if the misperception is positive, otherwise zero), and demographic characteristics. The treatment is an indicator for being in the respective treatment group. The misperception is belief minus actual position, and the difference in percentage points is divided by 100, so a misperception of 0.01 means that the believed rank is 1 percentage point higher than the actual position. Demographic characteristics are defined as binary variables. Spouse is an indicator for living with spouse, Child(ren) for living with a child or children, High education for having a master's degree or higher level of education, Metropolitan area for living in the capital region of Finland (Helsinki, Espoo, Vantaa or Kauniainen). Female, High education, and Metropolitan area are taken from SF's registers.

Table B30. Mean change of well-being measures (main specification)

Reference group		Outcome				Obs. (No bias)
		Income satisfaction	Fairness	Wage satisfaction	Life satisfaction	
Education	Misperception≥0	-0.221 (0.004)	-0.119 (0.003)	-0.129 (0.003)	-0.057 (0.001)	806 (51)
	Misperception<0	0.126 (0.003)	0.157 (0.002)	0.154 (0.002)	0.046 (0.001)	3771
	Overall	0.065 (0.003)	0.108 (0.002)	0.105 (0.002)	0.028 (0.001)	4577
Occupation	Misperception≥0	-0.178 (0.002)	0.008 (0.001)	-0.076 (0.001)	-0.092 (0.001)	1455 (65)
	Misperception<0	0.074 (0.002)	0.128 (0.001)	0.011 (0.001)	0.078 (0.001)	3122
	Overall	-0.006 (0.002)	0.090 (0.001)	-0.016 (0.001)	0.024 (0.002)	4577
Municipality	Misperception≥0	-0.122 (0.004)	-0.078 (0.005)	0.015 (0.001)	-0.012 (0.001)	482 (57)
	Misperception<0	0.145 (0.002)	0.219 (0.002)	0.052 (0.000)	0.030 (0.000)	4095
	Overall	0.117 (0.002)	0.187 (0.002)	0.048 (0.000)	0.026 (0.000)	4577
Age	Misperception≥0	-0.092 (0.003)	0.121 (0.001)	0.057 (0.001)	-0.034 (0.001)	1110 (73)
	Misperception<0	0.156 (0.002)	0.208 (0.001)	0.127 (0.001)	0.058 (0.001)	3467
	Overall	0.096 (0.002)	0.187 (0.001)	0.110 (0.001)	0.036 (0.001)	4577

Notes: Each number is the mean change of a well-being measure among the respondents (excl. treatment Choice). For each respondent, the change of a well-being measure is computed by $\hat{\beta}[\text{Treatment}] + \hat{\beta}[\text{Treatment} \times \text{Misperception}] * (\text{Observed misperception})$, where the coefficients are from the main specification estimation (see Tables 3, 4, 5, and 6). E.g., the mean change of satisfaction with own disposable income is -0.221 (0.126) standard deviations when those who overestimated (underestimated) their rank among same education are informed about their rank. The standard errors of the mean values are in the parentheses. The number of observations in parentheses are the number of respondents whose belief about the income rank is the same as their actual rank.

Table B31. Mean change of well-being measures (linear spline model)

Reference group		Income satisfaction	Fairness	Wage satisfaction	Life satisfaction	Obs. (No bias)
Education	Misperception>0	-0.268 (0.008)	-0.160 (0.006)	-0.158 (0.005)	-0.067 (0.002)	755
	Misperception≤0	0.132 (0.002)	0.163 (0.001)	0.156 (0.002)	0.047 (0.001)	3822 (51)
	Overall	0.066 (0.003)	0.109 (0.002)	0.104 (0.002)	0.028 (0.001)	4577
Occupation	Misperception>0	-0.187 (0.003)	0.007 (0.001)	-0.078 (0.001)	-0.106 (0.002)	1390
	Misperception≤0	0.073 (0.002)	0.127 (0.001)	0.010 (0.001)	0.080 (0.001)	3187 (65)
	Overall	-0.006 (0.002)	0.090 (0.001)	-0.016 (0.001)	0.024 (0.002)	4577
Municipality	Misperception>0	-0.195 (0.009)	-0.164 (0.010)	-0.229 (0.018)	-0.004 (0.000)	425
	Misperception≤0	0.147 (0.002)	0.221 (0.002)	0.069 (0.001)	0.029 (0.000)	4152 (57)
	Overall	0.115 (0.002)	0.185 (0.002)	0.041 (0.002)	0.026 (0.000)	4577
Age	Misperception>0	-0.164 (0.007)	0.117 (0.001)	0.047 (0.001)	-0.037 (0.001)	1037
	Misperception≤0	0.162 (0.001)	0.207 (0.001)	0.127 (0.000)	0.057 (0.001)	3540 (73)
	Overall	0.088 (0.003)	0.187 (0.001)	0.109 (0.001)	0.036 (0.001)	4577

The "Outcome" header spans the Income satisfaction, Fairness, Wage satisfaction, and Life satisfaction columns.

Notes: Each number is the mean change of a well-being measure among the respondents (excl. treatment Choice). For each respondent, the change of a well-being measure is computed by $\hat{\beta}[\text{Treatment}] + (\hat{\beta}[\text{Treatment} \times \text{Misperception}] + \hat{\beta}[\text{treatment} \times \text{Misperception}^{+}]) * (\text{Observed misperception})$, where the coefficients are from the linear spline specification estimation (see Tables B23, B24, B25, and B26). E.g., the mean change of satisfaction with own disposable income is -0.268 (0.132) standard deviations when those who overestimated (underestimated) their rank among same education are informed about their rank. The standard errors of the mean values are in the parentheses. The number of observations in parentheses are the number of respondents whose belief about the income rank is the same as their actual rank.

B.5 Results: Equality of the information effect across treatments

Table B32. Test equality of the coefficient of Treatment×Misperception across the reference groups

Outcome	Pairwise test of equality										Joint equality
	Age vs. Muni	Age vs. Edu	Age vs. Occu	Age vs. Nat	Muni vs. Edu	Muni vs. Occu	Muni vs. Nat	Edu vs. Occu	Edu vs. Nat	Occu vs. Nat	
Income satisfaction	-0.768 vs. -0.735	-0.768 vs. -0.871	-0.768 vs. -0.594	-0.768 vs. -0.074	-0.735 vs. -0.871	-0.735 vs. -0.594	-0.735 vs. -0.074	-0.871 vs. -0.594	-0.871 vs. -0.074	-0.594 vs. -0.074	
p-value	0.909	0.713	0.514	**0.021**	0.633	0.616	**0.029**	0.265	**0.008**	0.077	0.072
Adjusted p-value	0.909	1.000	1.000	0.193	1.000	1.000	0.232	1.000	0.077	0.542	
Fairness of income	-0.269 vs. -0.816	-0.269 vs. -0.694	-0.269 vs. -0.283	-0.269 vs. -0.259	-0.816 vs. -0.694	-0.816 vs. -0.283	-0.816 vs. -0.259	-0.694 vs. -0.283	-0.694 vs. -0.259	-0.283 vs. -0.259	
p-value	0.063	0.118	0.957	0.972	0.673	0.062	0.066	0.088	0.132	0.932	0.118
Adjusted p-value	0.566	0.711	1.000	0.972	1.000	0.624	0.529	0.615	0.662	1.000	
Wage satisfaction	-0.216 vs. -0.101	-0.216 vs. -0.712	-0.216 vs. -0.207	-0.216 vs. 0.329	-0.101 vs. -0.712	-0.101 vs. -0.207	-0.101 vs. 0.329	-0.712 vs. -0.207	-0.712 vs. 0.329	-0.207 vs. 0.329	
p-value	0.724	0.099	0.973	0.089	0.053	0.732	0.190	0.056	**0.001**	0.086	**0.028**
Adjusted p-value	1.000	0.496	0.973	0.535	0.476	1.000	0.762	0.450	**0.012**	0.603	

Notes: The null hypothesis of the pairwise tests is that the coefficients of Treatment×Misperception are equal between a pair of treated groups. The null hypothesis of the joint test of equality is that the coefficient of Treatment×Misperception is equal across the five regressions of the corresponding reference groups. For the pairwise tests, the *p*-value is unadjusted for a single test and the adjusted *p*-value is Holm's adjusted *p*-value for the 10 pairwise tests of each outcome. The comparisons with $p < 0.05$ are highlighted with *p*-value in bold font and background color of light gray. The sizes of the estimates are shown for each outcome above the row of *p*-values. The estimates of the coefficients of Treatment×Misperception are from the regression results in Table 3, 4, and 5. The test procedure: 1) Stack the data by duplicating the control group 4 times, so that there become 'five' control groups. 2) Each (identical) control group is matched with one treated group and used in one regression for each outcome. 3) The method, Seemingly Unrelated Estimation (Weesie, 1999), is used to combine the five regression results and produce a simultaneous covariance matrix. 4) Such stacking means the five control groups are the same and the five regressions have inter-dependent samples. To account for the problem of a non-zero covariance between the estimators of the regressions, cluster robust standard error (cluster at subject-level) is used.

Table B33. Test equality of the effect of misperception across the treated groups

Outcome	Pairwise test of equality										Joint equality
	Age vs. Muni	Age vs. Edu	Age vs. Occu	Age vs. Nat	Muni vs. Edu	Muni vs. Occu	Muni vs. Nat	Edu vs. Occu	Edu vs. Nat	Occu vs. Nat	
Income satisfaction	-0.718 vs. -0.060	-0.718 vs. -0.288	-0.718 vs. -0.371	-0.718 vs. 0.421	-0.060 vs. -0.288	-0.060 vs. -0.371	-0.060 vs. 0.421	-0.288 vs. -0.371	-0.288 vs. 0.421	-0.371 vs. 0.421	
p-value	**0.009**	0.071	0.125	**0.000**	0.351	0.181	0.076	0.702	**0.006**	**0.001**	**0.000**
Adjusted p-value	0.065	0.429	0.500	**0.000**	0.701	0.544	0.380	0.702	**0.048**	**0.012**	
Fairness of income	-0.233 vs. -0.482	-0.233 vs. -0.251	-0.233 vs. 0.002	-0.233 vs. 0.007	-0.482 vs. -0.251	-0.482 vs. 0.002	-0.482 vs. 0.007	-0.251 vs. 0.002	-0.251 vs. 0.007	0.002 vs. 0.007	
p-value	0.326	0.936	0.277	0.338	0.350	**0.040**	0.067	0.226	0.290	0.981	0.235
Adjusted p-value	1.000	1.000	1.000	1.000	1.000	0.398	0.601	1.000	1.000	0.981	
Wage satisfaction	-0.191 vs. 0.354	-0.191 vs. -0.229	-0.191 vs. -0.178	-0.191 vs. 0.634	0.354 vs. -0.229	0.354 vs. -0.178	0.354 vs. 0.634	-0.229 vs. -0.178	-0.229 vs. 0.634	-0.178 vs. 0.634	
p-value	0.055	0.884	0.956	**0.003**	**0.035**	**0.040**	0.344	0.825	**0.002**	**0.002**	**0.003**
Adjusted p-value	0.275	1.000	0.956	**0.027**	0.243	0.238	1.000	1.000	**0.014**	**0.015**	

Notes: The null hypothesis of the pairwise tests is that the slopes of misperception are equal between a pair of treated groups. The null hypothesis of the joint test of equality is that the slopes of misperception for all the treated groups are all equal. For the pairwise tests, the p-value is unadjusted for a single test and the adjusted p-value is Holm's adjusted p-value for the 10 pairwise tests of each outcome. The comparisons with $p < 0.05$ are highlighted with p-value in bold font and background color of light gray. The effect of the misperception of the treatment groups is computed by adding the coefficient of Misperception and the coefficient of Treatment×Misperception. The estimates of the misperception slopes are shown for each outcome above the row of p-values. The estimates of the coefficients are from the regression results in Table 3, 4, and 5. The test procedure: 1) Stack the data by duplicating the control group 4 times, so that there become 'five' control groups. 2) Each (identical) control group is matched with one treated group and used in one regression for each outcome. 3) The method, Seemingly Unrelated Estimation (Weesie, 1999), is used to combine the five regression results and produce a simultaneous covariance matrix. 4) Such stacking means the five control groups are the same and the five regressions have inter-dependent samples. To account for the problem of a non-zero covariance between the estimators of the regressions, cluster robust standard error (cluster at subject-level) is used.

Appendix C   Robustness: specification curve analysis

Figure C1. Descriptive specification curve: Satisfaction with disposable income
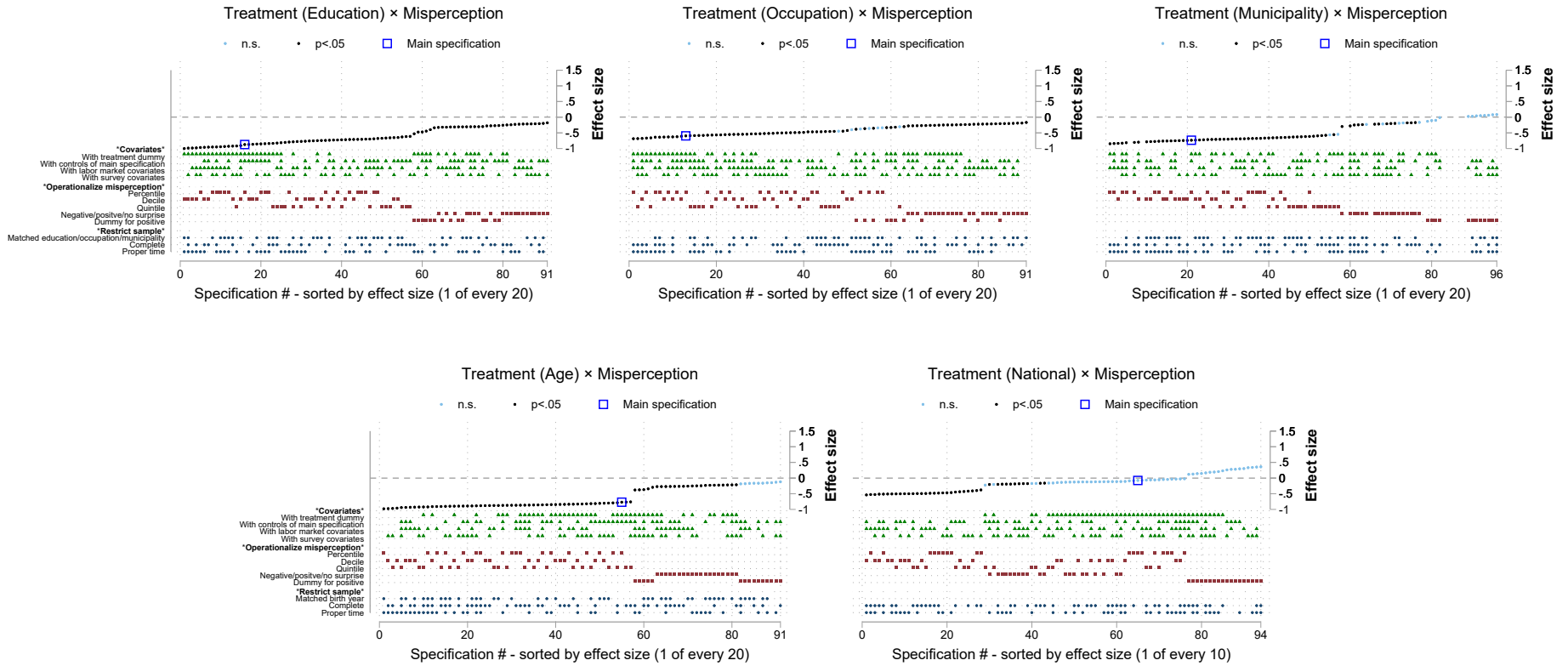
Notes: The figures show the descriptive specification curves for satisfaction with disposable income for the five treatments. In the top panel of each figure, each dot depicts the estimate of the effect of Treatment×Misperception on feeling disappointed/pleased with income. The dots vertically aligned below in the bottom panel indicate the model specification behind those estimates. For treatment NATIONAL, a total of 940 specifications were estimated. For each of the other four treatments, a total of around 1800 specifications were estimated; to facilitate visual inspection, all the estimates are sorted and one out of every 20 (10) estimates is plotted. NS, not significant ($P >= 0.05$). For comparison, the effect size of the main specification of Table 3 is plotted. All estimations use robust standard errors.

Figure C2. Descriptive specification curve: Fairness of own income
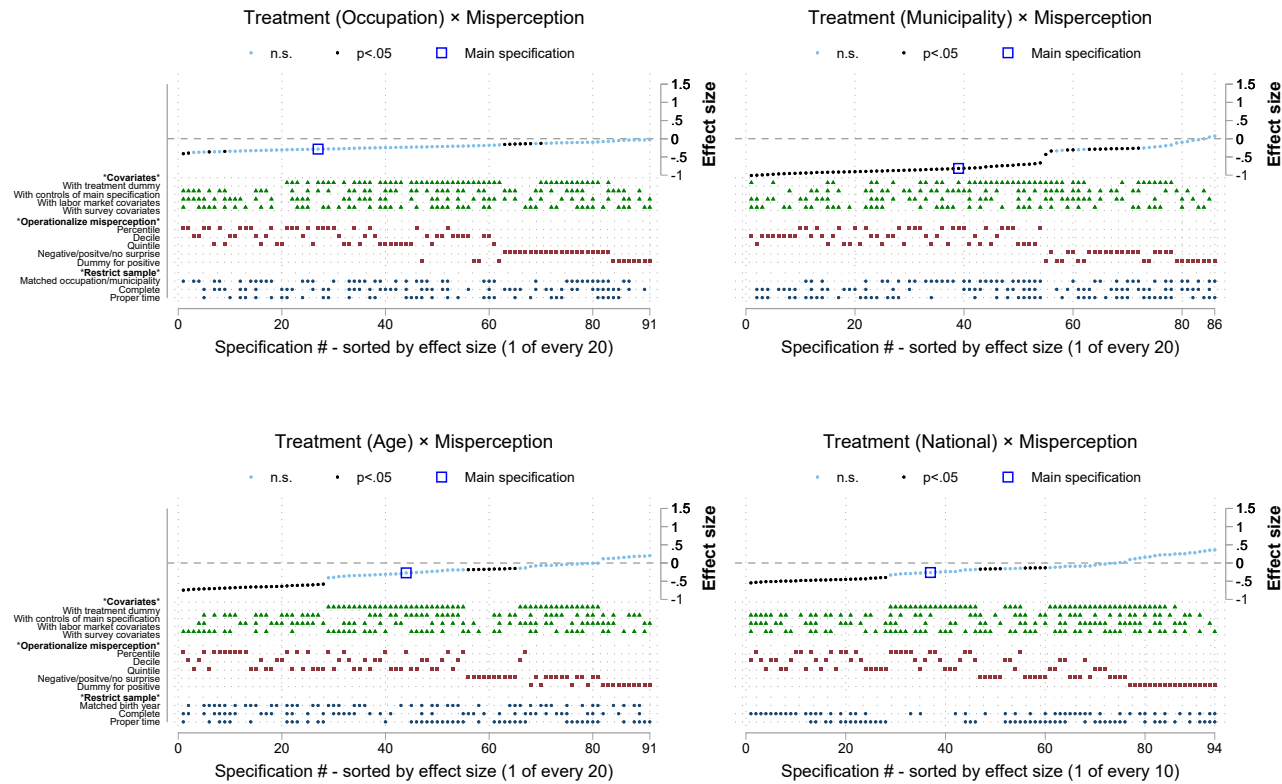
Notes: The figures show the descriptive specification curves for fairness of own income for the five treatments. In the top panel of each figure, each dot depicts the estimate of the effect of Treatment×Misperception on fairness of income. The dots vertically aligned below in the bottom panel indicate the model specification behind those estimates. For treatment NATIONAL, a total of 940 specifications were estimated. For each of the other four treatments, a total of around 1800 specifications were estimated; to facilitate visual inspection, all the estimates are sorted and one out of every 20 (10) estimates is plotted. NS, not significant ($P >= 0.05$). For comparison, the effect size of the main specification of Table 4 is plotted. All estimations use robust standard errors.

Figure C3. Descriptive specification curve: Wage satisfaction
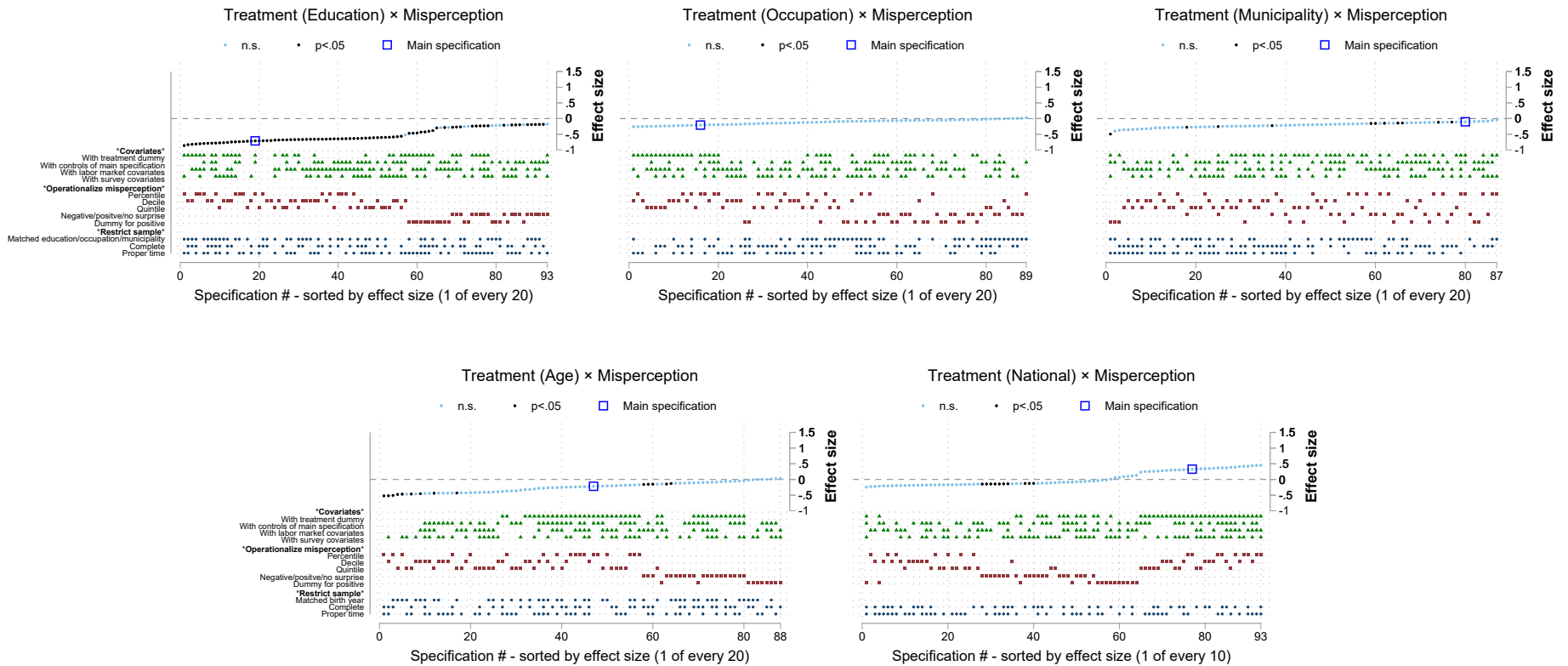
Notes: The figures show the descriptive specification curves for wage satisfaction for the five treatments. In the top panel of each figure, each dot depicts the estimate of the effect of Treatment×Misperception on wage satisfaction. The dots vertically aligned below in the bottom panel indicate the model specification behind those estimates. For treatment NATIONAL, a total of 940 specifications were estimated. For each of the other four treatments, a total of around 1800 specifications were estimated; to facilitate visual inspection, all the estimates are sorted and one out of every 20 (10) estimates is plotted. NS, not significant ($P >= 0.05$). For comparison, the effect size of the main specification of Table 5 is plotted. All estimations use robust standard errors.

Figure C4. Descriptive specification curve: Life satisfaction
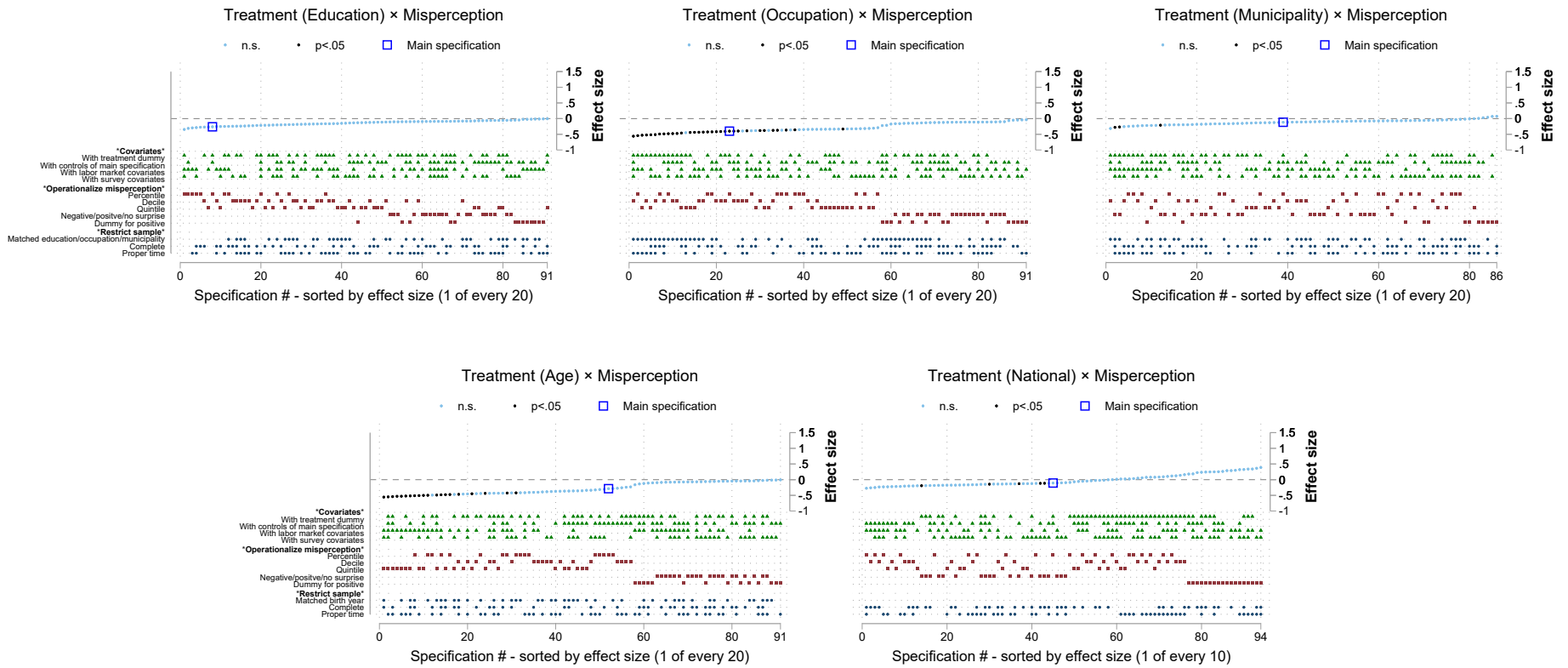
Notes: The figures show the descriptive specification curves for life satisfaction for the five treatments. In the top panel of each figure, each dot depicts the estimate of the effect of Treatment×Misperception on life satisfaction. The dots vertically aligned below in the bottom panel indicate the model specification behind those estimates. For treatment NATIONAL, a total of 940 specifications were estimated. For each of the other four treatments, a total of around 1800 specifications were estimated; to facilitate visual inspection, all the estimates are sorted and one out of every 20 (10) estimates is plotted. NS, not significant ($P >= 0.05$). For comparison, the effect size of the main specification of Table 6 is plotted. All estimations use robust standard errors.

Figure C5. Descriptive specification curve: Job satisfaction
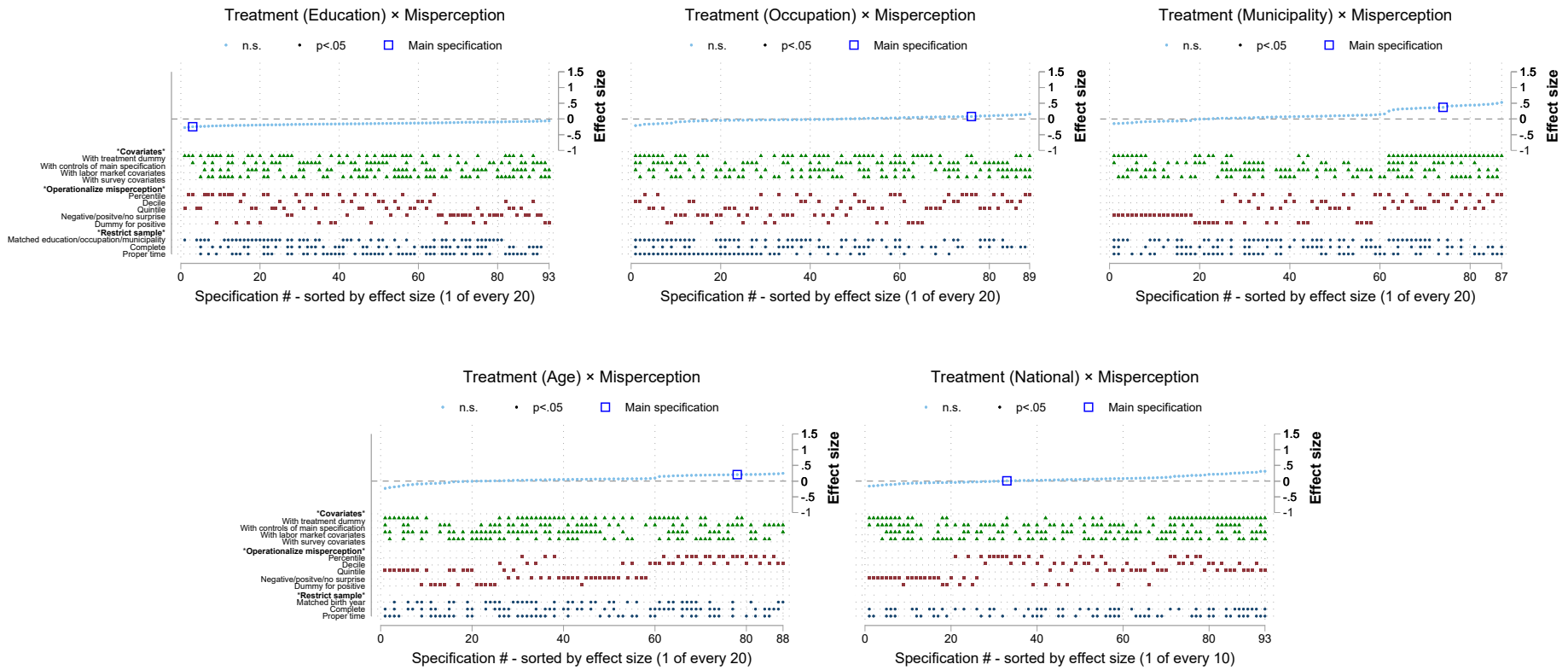
Notes: The figures show the descriptive specification curves for job satisfaction for the five treatments. In the top panel of each figure, each dot depicts the estimate of the effect of Treatment×Misperception on job satisfaction. The dots vertically aligned below in the bottom panel indicate the model specification behind those estimates. For treatment NATIONAL, a total of 930 specifications were estimated. For each of the other four treatments, a total of around 1800 specifications were estimated; to facilitate visual inspection, all the estimates are sorted and one out of every 20 (10) estimates is plotted. NS, not significant ($P >= 0.05$). For comparison, the effect size of the main specification of Table B17 is plotted. All estimations use robust standard errors.

Figure C6. Descriptive specification curve: Job meaningfulness
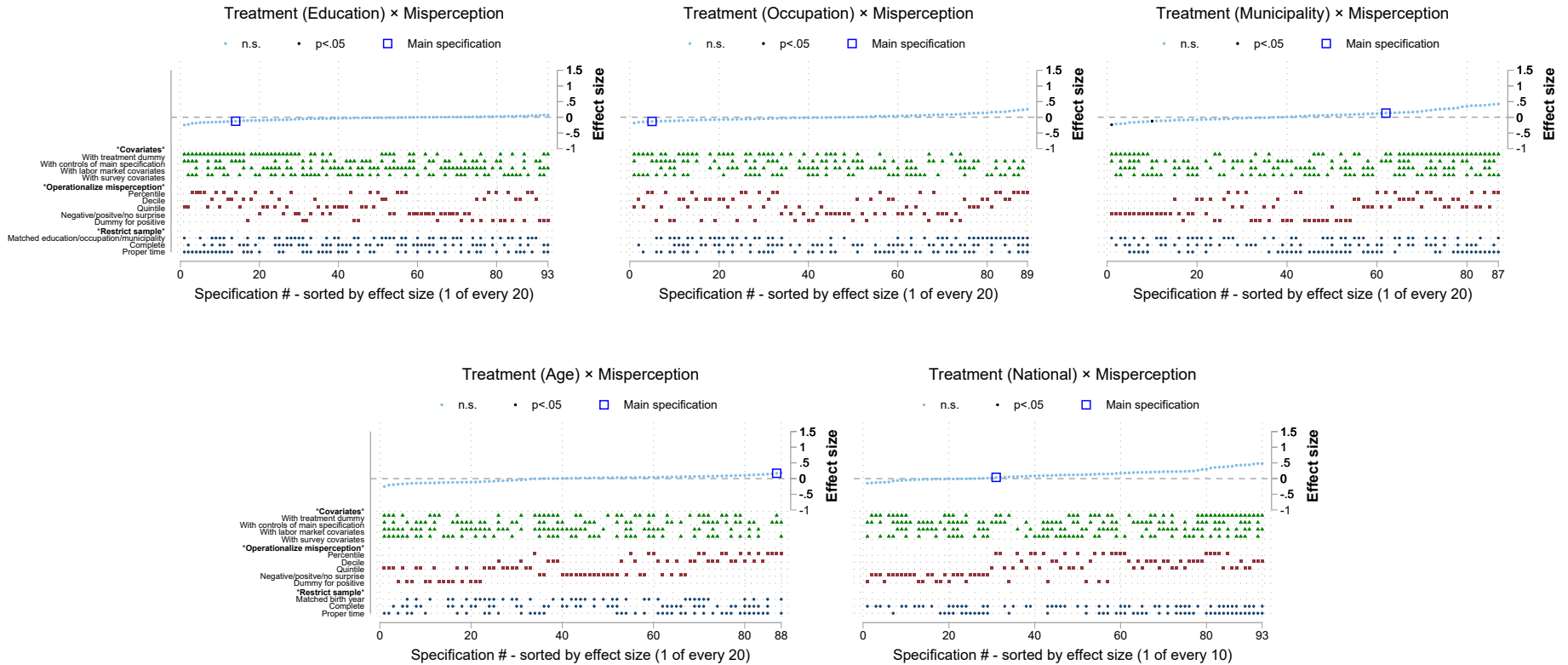
Notes: The figures show the descriptive specification curves for perceived meaningfulness of job for the five treatments. In the top panel of each figure, each dot depicts the estimate of the effect of Treatment×Misperception on feeling job is meaningful. The dots vertically aligned below in the bottom panel indicate the model specification behind those estimates. For treatment NATIONAL, a total of 930 specifications were estimated. For each of the other four treatments, a total of around 1800 specifications were estimated; to facilitate visual inspection, all the estimates are sorted and one out of every 20 (10) estimates is plotted. NS, not significant ($P >= 0.05$). For comparison, the effect size of the main specification of Table B19 is plotted. All estimations use robust standard errors.

Figure C7. Descriptive specification curve: Job search intentions
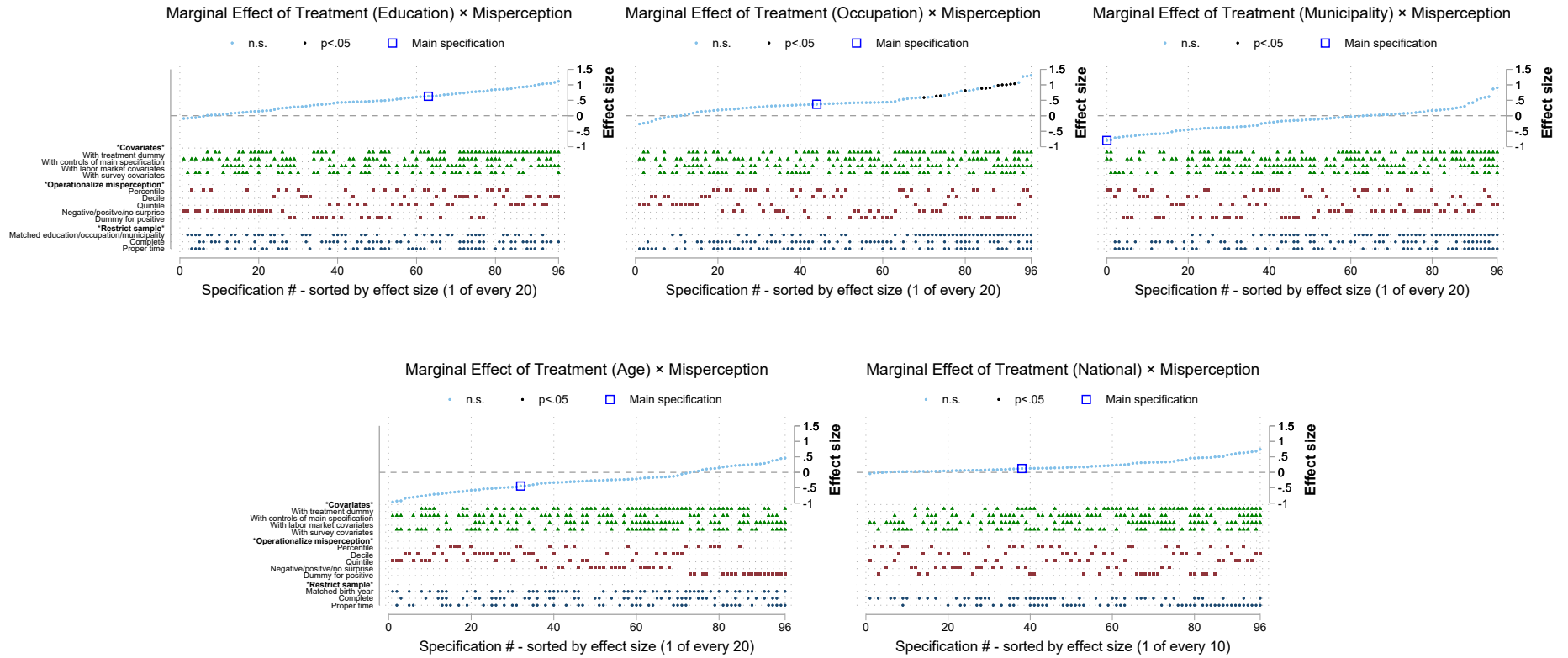
Notes: The figures show the descriptive specification curves for the job search intentions for the five treatments. In the top panel of each figure, each dot depicts the marginal effect of Treatment×Misperception on the likelihood of searching for a new job. The dots vertically aligned below in the bottom panel indicate the model specification behind those estimates. For treatment All, a total of 960 specifications were estimated. For each of the other four treatments, a total of around 1900 specifications were estimated; to facilitate visual inspection, all the estimates are sorted and one out of every 20 (10) estimates is plotted. NS, not significant ($P >= 0.05$). For comparison, the effect size of the main specification of Table B21 is plotted. All estimations use robust standard errors.

Figure C8. Observed and expected under-the-null specification curves: Satisfaction with disposable income

(a) Treatment (Education) × Misperception
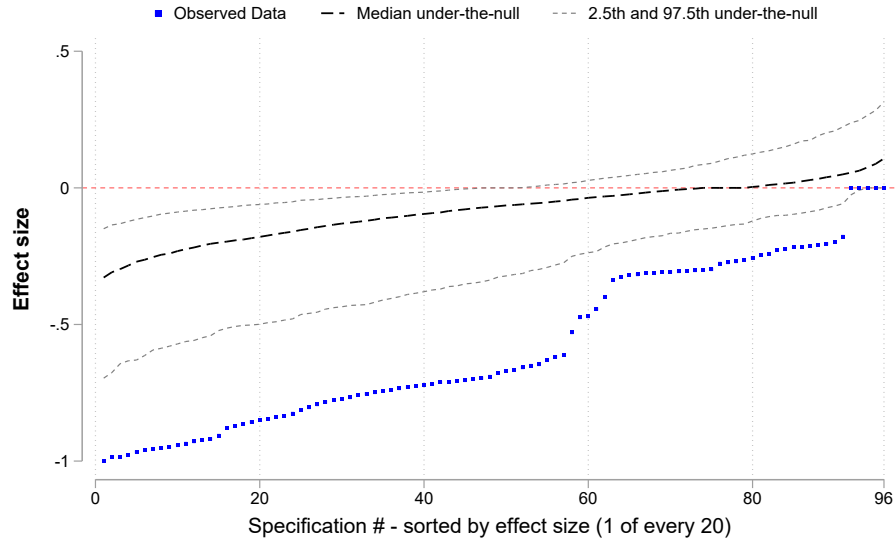
(b) Treatment (Occupation) × Misperception
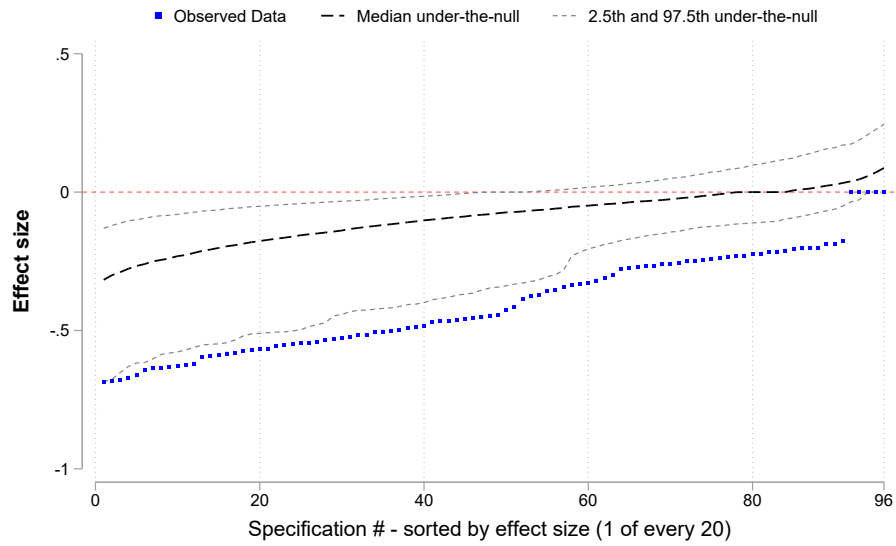
(c) Treatment (Municipality) × Misperception
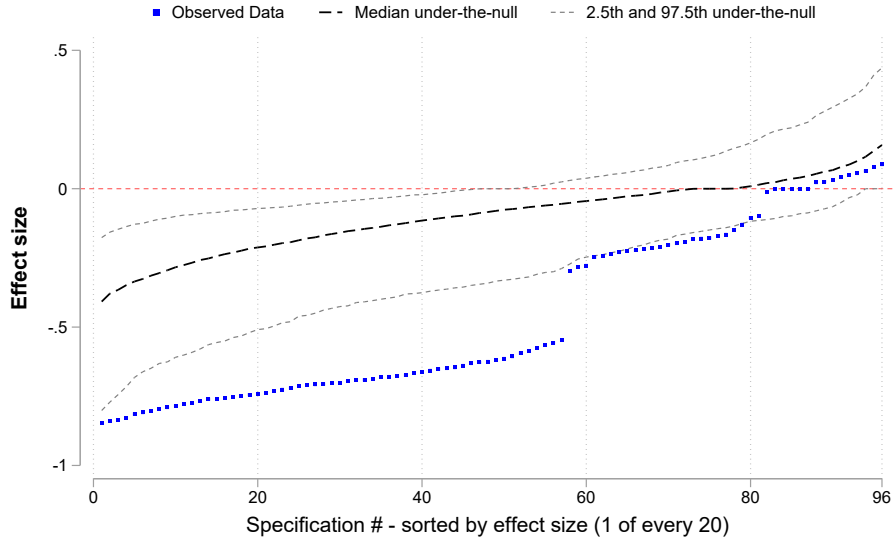
(d) Treatment (Age) × Misperception
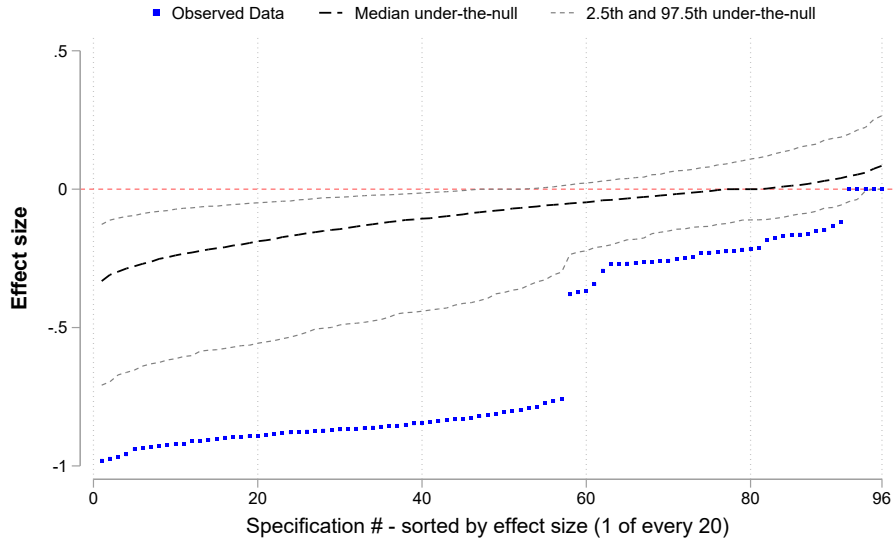
Notes: Observed and expected under-the-null specification curves for Feeling pleased with income. The expected curves are based on 500 shuffled samples where the randomly assigned variable, treatment dummy, is shuffled. All specifications are estimated in each shuffled sample (1920 specifications). The curves plot the estimate of the coefficient of the interaction term, $Treatment \times Misperception$. The resulting estimates for each shuffled sample are ranked from smallest to largest. The dashed lines depict the 2.5^{th}, 50th and 97.5^{th} percentiles for each of these ranked estimates.

Figure C9. Observed and expected under-the-null specification curves: Fairness of own income
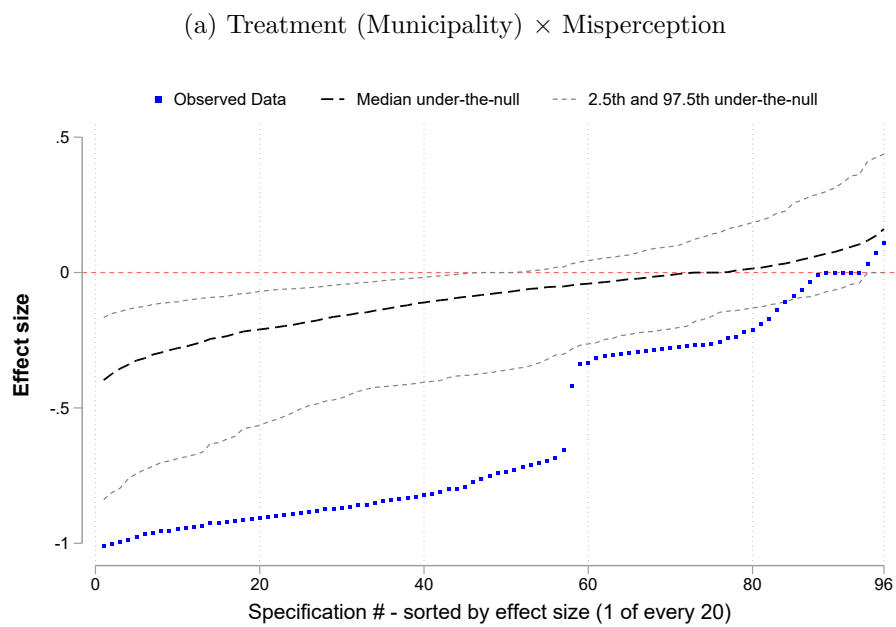
(a) Treatment (Municipality) × Misperception

Notes: Observed and expected under-the-null specification curves for Fairness of own income. The expected curves are based on 500 shuffled samples where the randomly assigned variable, treatment dummy, is shuffled. All specifications are estimated in each shuffled sample (1920 specifications). The curves plot the estimate of the coefficient of the interaction term, $Treatment \times Misperception$. The resulting estimates for each shuffled sample are ranked from smallest to largest. The dashed lines depict the 2.5^{th}, 50th and 97.5^{th} percentiles for each of these ranked estimates.

Figure C10. Observed and expected under-the-null specification curves: Wage satisfaction
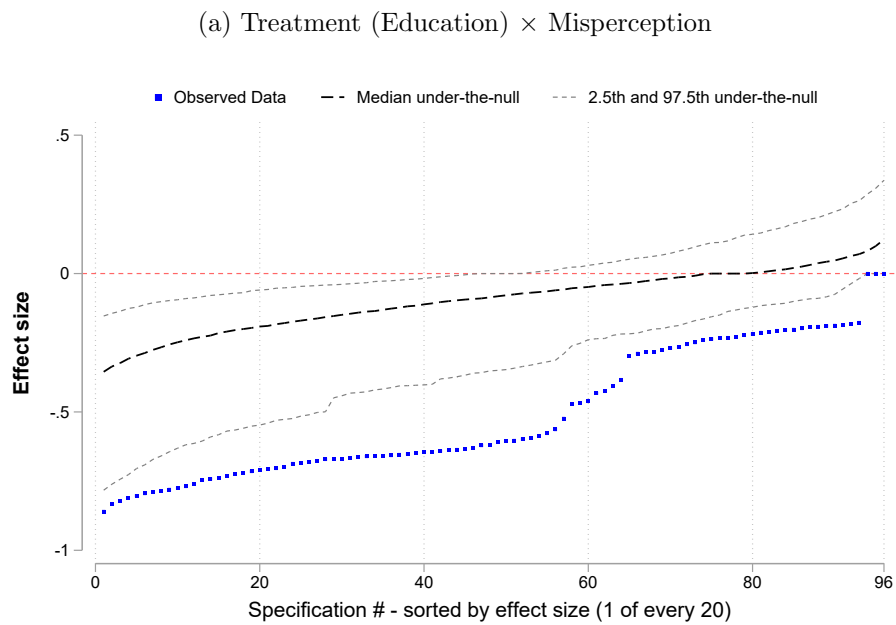
(a) Treatment (Education) × Misperception

Notes: Observed and expected under-the-null specification curves for Wage satisfaction in treatment Education. The expected curves are based on 500 shuffled samples where the randomly assigned variable, treatment dummy, is shuffled. All specifications are estimated in each shuffled sample (1920 specifications). The curves plot the estimate of the coefficient of the interaction term, $Treatment \times Misperception$. The resulting estimates for each shuffled sample are ranked from smallest to largest. The dashed lines depict the 2.5^{th}, 50th and 97.5^{th} percentiles for each of these ranked estimates.

Figure C11. Observed and expected under-the-null specification curves: Life satis-faction
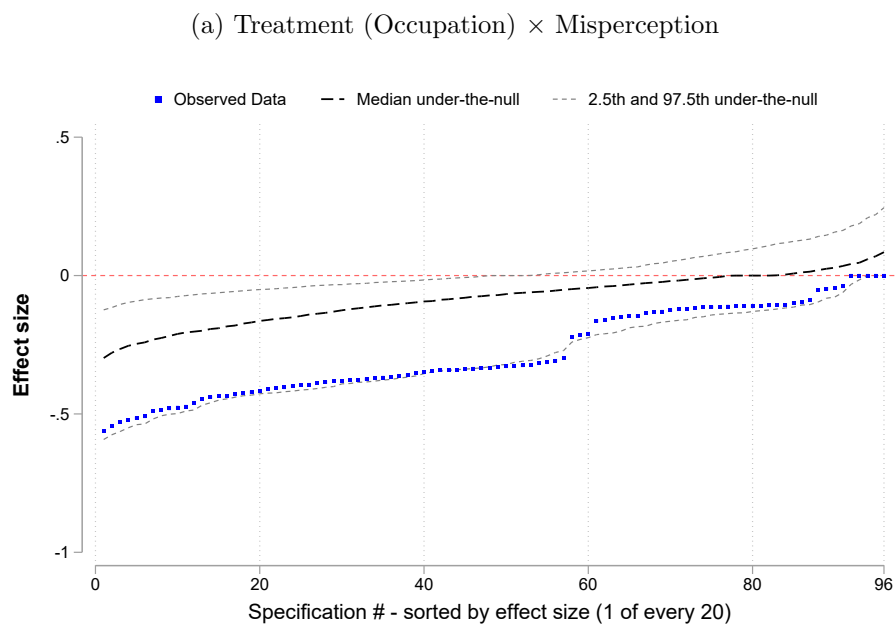
(a) Treatment (Occupation) × Misperception

Notes: Observed and expected under-the-null specification curves for Life satisfaction in treatment Occupation. The expected curves are based on 500 shuffled samples where the randomly assigned variable, treatment dummy, is shuffled. All specifications are estimated in each shuffled sample (1920 specifications). The curves plot the estimate of the coefficient of the interaction term, $Treatment \times Misperception$. The resulting estimates for each shuffled sample are ranked from smallest to largest. The dashed lines depict the 2.5^{th}, 50th and 97.5^{th} percentiles for each of these ranked estimates.

Table C8. Joint tests for inferential specification curves

Outcome	Treatment	Test statistic	Observed result	P value
Income satisfaction	Education	Share of significant results	1824 of 1824 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.701 SD	$P < 0.002$
		Aggregate all P-values	Stouffer $Z = 150.99$	$P < 0.002$
	Occupation	Share of significant results	1650 of 1830 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.455 SD	$P = 0.012$
		Aggregate all P-values	Stouffer $Z = 115.98$	$P = 0.002$
	Municipality	Share of significant results	1386 of 1734 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.631 SD	$P < 0.002$
		Aggregate all P-values	Stouffer $Z = 111.50$	$P < 0.002$
	Age	Share of significant results	1632 of 1824 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.828 SD	$P < 0.002$
		Aggregate all P-values	Stouffer $Z = 144.43$	$P < 0.002$
Fairness of income	Education	Share of significant results	1548 of 1824 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.702 SD	$P < 0.002$
		Aggregate all P-values	Stouffer $Z = 126.59$	$P < 0.002$
	Municipality	Share of significant results	1416 of 1734 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.784 SD	$P < 0.002$
		Aggregate all P-values	Stouffer $Z = 139.51$	$P < 0.002$
Wage satisfaction	Education	Share of significant results	1674 of 1872 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.627 SD	$P = 0.002$
		Aggregate all P-values	Stouffer $Z = 121.90$	$P < 0.002$
Life satisfaction	Occupation	Share of significant results	588 of 1830 specifications	$P = 0.036$
		Median effect size	Rank info. decreases the slope of misperception by 0.336 SD	$P = 0.026$
		Aggregate all P-values	Stouffer $Z = 74.82$	$P = 0.034$

Notes: For each outcome and treatment, we shuffled the treatment dummy for 500 times and estimated all the specifications in Table 7 with each shuffled sample. The share of significant results is the proportion of significant results with the dominant sign out of all specifications. The Stouffer Z-value is constructed by converting each P-value to a Z-score and computing the weighted average of the Z-scores with the weight equal to 1 divided by the square root of the number of the P-values (specifications). Each overall P-value is computed by the proportion of shuffled samples leading to a test statistic at least as extreme as in the observed sample. I.e., when there are 50 out of 500 shuffled samples showing a share of significant results that is larger than the share of the observed sample, the p-value is 0.10. When no shuffled sample is as extreme as the observed, we report $P < 0.002$ because it is less frequent than 1 out of the 500 shuffled samples.

Table C9. Joint tests for inferential specification curves (hold treatment dummy incl.)

Outcome	Treatment	Test statistic	Observed result	P value
Income satisfaction	Education	Share of significant results	864 of 864 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.840 SD	$P < 0.002$
		Aggregate all P values	Stouffer $Z = 106.04$	$P < 0.002$
	Occupation	Share of significant results	834 of 870 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.544 SD	$P = 0.008$
		Aggregate all P values	Stouffer $Z = 86.01$	$P < 0.002$
	Municipality	Share of significant results	642 of 807 specifications	$P = 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.657 SD	$P < 0.002$
		Aggregate all P values	Stouffer $Z = 63.50$	$P = 0.002$
	Age	Share of significant results	864 of 864 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.822 SD	$P < 0.002$
		Aggregate all P values	Stouffer $Z = 94.45$	$P < 0.002$
Fairness of income	Education	Share of significant results	780 of 864 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.727 SD	$P < 0.002$
		Aggregate all P values	Stouffer $Z = 81.71$	$P < 0.002$
	Municipality	Share of significant results	672 of 807 specifications	$P = 0.008$
		Median effect size	Rank info. decreases the slope of misperception by 0.739 SD	$P < 0.002$
		Aggregate all P values	Stouffer $Z = 72.19$	$P = 0.002$
Wage satisfaction	Education	Share of significant results	558 of 624 specifications	$P < 0.002$
		Median effect size	Rank info. decreases the slope of misperception by 0.627 SD	$P = 0.002$
		Aggregate all P values	Stouffer $Z = 70.38$	$P < 0.002$
Life satisfaction	Occupation	Share of significant results	345 of 870 specifications	$P = 0.030$
		Median effect size	Rank info. decreases the slope of misperception by 0.364 SD	$P = 0.028$
		Aggregate all P values	Stouffer $Z = 54.69$	$P = 0.030$

Notes: For each outcome and treatment, we shuffled the treatment dummy for 500 times and estimated all the specifications in Table 7 with each shuffled sample. The share of significant results is the proportion of significant results with the dominant sign out of all specifications. The Stouffer Z-value is constructed by converting each P value to a Z-score and computing the weighted average of the Z-scores with the weight equal to 1 divided by the square root of the number of the P values (specifications). Each overall P value is computed by the proportion of shuffled samples leading to a test statistic at least as extreme as in the observed sample. I.e., when there are 50 out of 500 shuffled samples showing a share of significant results that is larger than the share of the observed sample, the p-value is 0.10. When no shuffled sample is as extreme as the observed, we report $P < 0.002$ because it is less frequent than 1 out of the 500 shuffled samples.

Appendix D   Description of the online survey

The original survey was conducted in both Finnish and Swedish. The survey consists of five sections, which are further divided into 17 blocks.

1. Log-in and background questions

    - Block 1: Participants log in and respond to questions concerning their birth year, gender, who they live with, highest education in 2018, occupation in 2018, and municipality of residence in 2018. [If the participants log in with their username after the first time, they would access the survey webpage where they stopped if they have accidentally left the survey or the final webpage if they have finished.]

2. Incentivized income rank belief elicitation

    - Block 2: Participants report their beliefs about the percentage of Finns who had lower disposable income than them in 2018 in each of the five reference groups (same municipality, same age, same education, same occupation, all Finland). Reference groups are displayed in random order.

3. Income rank information provision treatment

    - Block 3 Choice of information: [Displayed only to participants in treatment CHOICE.] Participants choose one of the five reference groups for which they want to learn their income rank. After making a choice, participants give reasons for the choice by ticking suitable alternatives in a multiple choice question and answering in an open text field as they wish.

    - Block 4 Information treatment: [Not displayed to participants in treatment CONTROL.] Participants receive information about their disposable income relative to others in the reference group corresponding to their treatment assignment. Participants in treatment CHOICE see their income rank in the reference group corresponding to their choice in Block 3.

4. Outcome questions

    - Block 5 Life satisfaction and future plans: Participants answer questions concerning 1) fairness of their income and feelings about their income, 2) life satisfaction, and 3) intentions to invest, gamble and search for a new

job. Then, they also report their current employment status and whether they are members of an employment union or association.

- Block 6 Job satisfaction: [This block is displayed only to participants who report being currently employed or furloughed based on their answer in block 5.] Participants answer questions concerning job satisfaction, wage satisfaction, and meaningfulness of their job.

- Block 7 Trust in institutions: Participants report their trust in government, employee unions, and politicians.

- Block 8 Attitudes toward immigration and trade policies: Participants answer questions concerning attitudes toward immigration and foreign imports.

- Block 9 Attitudes toward welfare policy: Participants answer questions concerning attitudes toward job-search-dependent unemployment benefits and the basic income scheme.

- Block 10 Income redistribution: Participants answer questions concerning ideal minimum monthly disposable income, tax rate for the highest earning 1% of Finns, inheritance tax rates, whether there should be more or less income redistribution and whether it is acceptable to take advantage of the tax code to minimize one's tax burden.

- Block 11 Preferred income distribution: Participants indicate their preferred income distributions.

- Block 12 Just world beliefs: Participants answer questions concerning beliefs about the role of luck and effort, fairness of chances in getting a job and achieving the education one aspires to.

- Block 13 Self-assessment: Participants answer questions concerning their social preferences (Falk et al., 2018) (such as trust, positive and negative reciprocity, competitiveness).

- Block 14 Willingness to act: Participants answer questions concerning patience, altruism and risk taking (Falk et al., 2018).

- Block 15 Political orientation: Participants answer questions concerning their political orientation on spectrum right/left and liberal/conservative and which party they would vote for if there was an election today.

- Block 16 Incentivized tasks: Participants decide how much (0-15 Euro) of their payoff of 15 Euro they want to donate to charity, donate as a voluntary tax, and spend on lotto tickets. One of the three decisions is randomly chosen and implemented.

5. Summary

- Block 17 Summary: Participants receive reminder of the income rank information provided in Block 4, whether they hit the correct interval in the incentivized beliefs question in Block 3, and their final payment including which of the incentivized decisions made in Block 15 was randomly chosen and implemented.

Blocks 1 to 4 and Blocks 13 to 17 are in the specified order. In the Outcome questions section, Blocks 5 and 6 are bound together such that Block 5 always precedes Block 6. Blocks 7 to 11 are bound together and shown in a random order with a restriction that Blocks 10 and 11 are always next to each other. The order of the three bundles, 5&6, 7 to 11, and 12, is randomized. Within each of the blocks in the Outcome questions section, the order of questions is randomized, except in Block 6 in which the question concerning wage satisfaction precedes that of general job satisfaction.[43] In particular, in Block 5, the three parts, (1) to (3), are in a random order and the three questions within part (3) are also in a random order. In Block 12, the order of the questions about fair opportunities in education and job are randomized and the order of the bundle and the question about fairness in outcome is randomized. The full survey and questions can be found in the survey screens in Appendix E.

---

[43]The objective is to obtain the respondents assessment of job satisfaction *net* of wage satisfaction.

Appendix E   Screens of the online survey

Thank you for participating in this survey.

You can guarantee yourself a payment of 15 euros by completing the survey. It takes on average 20 minutes to complete.

To log in the survey, please write your username (for a second time) and your password in the fields below. You can find them both in the invitation letter. After you have filled in your username and password, click "Next".

Please note that it is not possible to return to the previous page in this query after pressing the "Next" button.

Username: [   ]

Password: [   ]

[Next]

In this section, we will ask some background questions.

What is your year of birth?

[⌄]

What is your gender?
- ○ Male
- ○ Female
- ○ Non-binary (other)
- ○ Prefer not to answer

Who do you currently live with?
- ○ I live alone
- ○ Together with my spouse
- ○ I live with my spouse and child(ren)
- ○ Alone with a child/children
- ○ Some other situation

For the following questions, we ask that you think of your situation **in the end of 2018**. We are interested in your situation in 2018 because it is the most recent year when Statistics Finland has finished collecting register data.

What was your level of education? Please choose the option that best describes the highest level of education you had completed.

[⌄]

What was your occupation (or mention if you were unemployed or not part of the labour force)? Please write your answer in the field below.

[_____]

Where did you live? Please write the name of your municipality of residence in the field below.

[_____]

[Next]
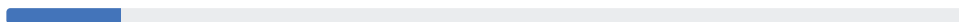
First, we would like to know about your assessment of the relationship between your income and the incomes of other Finns in 2018. Please give the most accurate and truthful assessment.

When answering the questions, we ask that you think of your situation **in the end of 2018**. We are interested in your situation in 2018 because it is the most recent year when Statistics Finland has finished collecting register data.

Suppose that Statistics Finland lines up individuals in the following 5 groups from the lowest income on the bottom to the highest income on the top based on their disposable incomes in 2018. **By income, we refer to the individual total annual disposable income, which contains income from labor and capital, as well as all transfers and subsidies like public unemployment payments and pensions (i.e. disposable income).**

You can earn money for the accuracy of your assessment. Notice: The survey program will randomly select one of the five questions below, and if your answer to the selected question is correct, you will receive 5 euros (in addition to the 15 euros you can secure by completing the study). You will be notified of the correct answer at the end of the survey.

> Your answer is correct if you hit the correct 5%-point interval among 0-5%, 6-10%, 11-15%, ..., 91-95%, 96-100%. I.e if the true value is 7%, then you will be compensated with 5 euros if your guess is 6, 7, 8, 9 or 10%, and any other guess is incorrect.

What was the proportion of **all adult (18 yrs or older) Finns** who had lower disposable income than you? Please tap on the bar below to indicate your assessment.
"**%** of all Finns had lower income than I."

```
—individual with highest income
—90%
—80%
—70%
—60%
—50%
—40%
—30%
—20%
—10%
—individual with lowest income
```
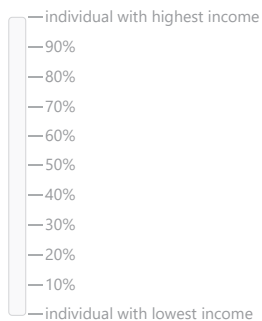
What was the proportion of **people with the same occupation as you**, who had lower disposable income than you? Based on register data, your occupational group was Teollisuuden ja rakentamisen avustavat työntekijät. Please tap on the bar below to indicate your assessment.
"**%** of people with the same occupation had lower disposable income than I."

```
—individual with highest income
—90%
—80%
—70%
—60%
—50%
—40%
—30%
—20%
—10%
—individual with lowest income
```
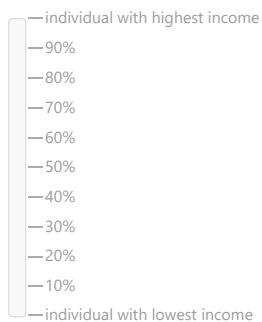
What was the proportion of **adults living in the same municipality (18 years or older)**, who had lower disposable income than you? Please tap on the bar below to indicate your assessment.
"**%** of people living in the same municipality had lower income than I."

```
— individual with highest income
— 90%
— 80%
— 70%
— 60%
— 50%
— 40%
— 30%
— 20%
— 10%
— individual with lowest income
```
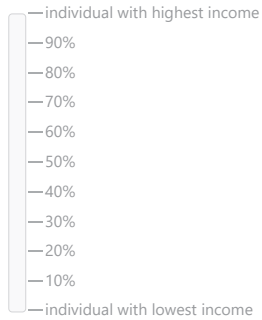
What was the proportion of **people born in the same year as you** who had lower disposable income than you? Please tap on the bar below to indicate your assessment.
"**%** of people born in the same year had lower disposable income than I."

```
— individual with highest income
— 90%
— 80%
— 70%
— 60%
— 50%
— 40%
— 30%
— 20%
— 10%
— individual with lowest income
```
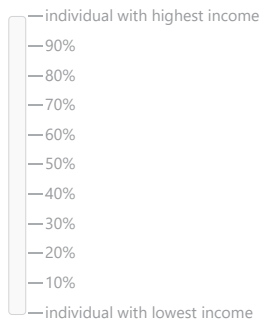
What was the proportion of **people with the same educational degree**, who had lower disposable income than you? You indicated your educational degree was Upper secondary level education. Please tap on the bar below to indicate your assessment.
"**%** of people with the same educational degree had lower disposable income than I."

```
— individual with highest income
— 90%
— 80%
— 70%
— 60%
— 50%
— 40%
— 30%
— 20%
— 10%
— individual with lowest income
```

Next

111
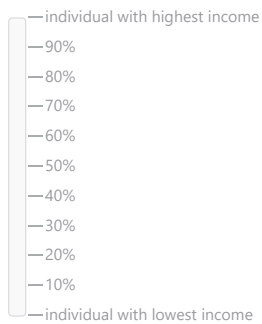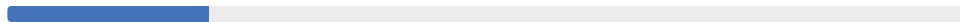
Which of the following would you most like to know about? You will receive this information later in the survey. (All pieces of information are drawn from the 2018.)

By income, we refer to the individual total annual disposable income, which contains income from labor and capital, as well as all transfers and subsidies like public unemployment payments and pensions (i.e. disposable income).

○ my income relative to those who had the same level of education

○ my income relative to all adult (18 yrs or older) Finns

○ my income relative to those adults (18 years or older) who lived in the same municipality

○ my income relative to those who had the same occupation

○ my income relative to those who are born in the same year

Next

In a previous question, you indicated that you would like to learn about your income relative to **those who lived in the same municipality**. What is your motivation for wanting to know about your income relative to this group? Please, tell us by checking one or more of the options listed below.

- ☐ I expect to use this information.
- ☐ I knew relatively little about my position in this group.
- ☐ This piece of information is difficult to find elsewhere.
- ☐ This piece of information is most important to me.
- ☐ I expected my income to be relatively high and wanted to check whether it holds true.
- ☐ I expected my income to be relatively low and wanted to check whether it holds true.
- ☐ I am not interested in comparing my income to others' incomes.
- ☐ Some information in the registers was incorrect, which affected my choice.
- ☐ Some other reason, what?

[Next]
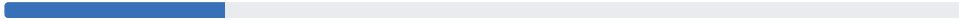
ONLY FOR TREATMENTS 2-6 (MUNI, EDU, OCCU, AGE, ALL)
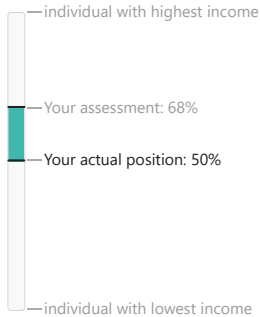
FOR NO-INCENTIVE: THE PARAGRAPH "THE GUESS ABOVE MAY NOT BE..." IS DROPPED.

In this section we would like to give you information about the relationship between your income and the incomes of **those who had the same level of education** in 2018.

By income, we refer to the individual total annual disposable income, which contains income from labor and capital, as well as all transfers and subsidies like public unemployment payments and pensions (i.e. disposable income).

— individual with highest income

— Your actual position: 73%

— Your assessment: 53%

— individual with lowest income

According to your assessment, **53%** of people who had the same level of education had lower income than you in 2018.

Actually, based on register data, **73%** of people who had the same level of education had lower income than you in 2018.

The guess above may not be the one that determines your bonus payment. One of the five guesses will be randomly selected to determine whether you get a bonus of 5 euro in addition to the 15 euro compensation.

Please choose the correct statement according to the information you see above. (This question is just to verify that you have understood the information in the figure.)

○ The actual proportion of people with lower income than I is **larger** than I thought.

○ The actual proportion of people with lower income than I is **smaller** than I thought.

○ The actual proportion of people with lower income than I is the **same** as I thought.

Next

ONLY FOR TREATMENT 7 CHOICE

FOR NO-INCENTIVE: THE PARAGRAPH "THE GUESS ABOVE MAY NOT BE..." IS DROPPED.

In this section we would like to give you your chosen information about the relationship between your income and the incomes of **those who lived in the same municipality** in 2018.

By income, we refer to the individual total annual disposable income, which contains income from labor and capital, as well as all transfers and subsidies like public unemployment payments and pensions (i.e. disposable income).

— individual with highest income

— Your assessment: 68%

— Your actual position: 50%

— individual with lowest income

According to your assessment, **68%** of people who lived in the same municipality had lower income than you in 2018.

Actually, based on register data, **50%** of people who lived in the same municipality had lower income than you in 2018.

The guess above may not be the one that determines your bonus payment. One of the five guesses will be randomly selected to determine whether you get a bonus of 5 euro in addition to the 15 euro compensation.

Please choose the correct statement according to the information you see above. (This question is just to verify that you have understood the information in the figure.)

○ The actual proportion of people with lower income than I is **larger** than I thought.
○ The actual proportion of people with lower income than I is **smaller** than I thought.
○ The actual proportion of people with lower income than I is the **same** as I thought.

Next

In this section, we ask about your life satisfaction and future plans.

In a previous part, you saw information about the relationship between your income and the incomes of those who had the same level of education in 2018.

> By income, we refer to the individual total annual disposable income, which contains income from labor and capital, as well as all transfers and subsidies like public unemployment payments and pensions (i.e. disposable income).

How would you evaluate the fairness of the level of your disposable income?

Unfairly   Fair   Unfairly
low   high

How do you feel about your disposable income?

Disappointed   Neither disappointed   Pleased
nor pleased

All things considered, how satisfied are you with your life as a whole nowadays?

extremely   Extremely
unsatisfied   satisfied

How likely is it that you will search for a new job in the next six months?

○ Very unlikely

○ Somewhat unlikely

○ Somewhat likely

○ Very likely

How likely is it that you will buy or sell stocks or assets (excluding the house you are living right now) during the next six months?

○ Very unlikely

○ Somewhat unlikely

○ Somewhat likely

○ Very likely

How likely is it that you will engage in gambling activities provided by Veikkaus during the next six months? By gambling activities, we mean for example buying tickets for the weekly national Lotto, playing slot machines and sports betting.

○ Very unlikely

○ Somewhat unlikely

○ Somewhat likely

○ Very likely

Which of the following best describes your **current** situation?

○ employed

○ self-employed or entrepreneur

○ furloughed

○ unemployed

○ not part of the labor force (e.g. student, on parental leave, pensioner)

Are you a member of any labor union or unemployment fund?

○ Yes

○ No

Next

The next questions concern your job or your primary occupation.
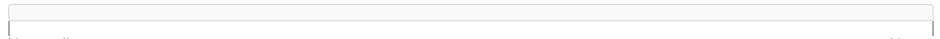
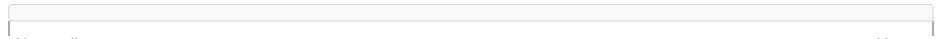How satisfied are you with how much you earn on your current job? Please tap the bar to mark your answer.

Not at all   Very
satisfied   satisfied

How satisfied are you with your job in general? Please tap the bar to mark your answer.

Not at all   Very
satisfied   satisfied

Does your work feel meaningful to you? Please tap the bar to mark your answer.

Not at all   Very
meaningful   meaningful

Next
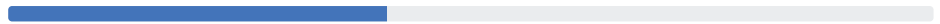
In this section, we ask about your views on various societal and political issues.

How much do you trust the following institutions in Finland? Please tap on the bar to indicate your views.

How much do you trust labor unions?

Very little   Very much

How much do you trust politicians in general?

Very little   Very much

How much do you trust public agencies?

Very little   Very much

Next
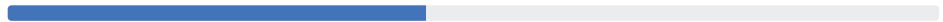
In this section, we ask about your views on various societal and political issues.

In your opinion, what should be done about foreign imports to promote jobs in Finland?

Make imports
more difficult

Make imports
easier

There are different opinions about immigrants from other countries living in Finland. By "immigrants", we mean people who come to settle in Finland. Do you think the number of immigrants to Finland nowadays should be increased or decreased. Please answer separately for each of the two following groups:

Work-based immigration should be:

> By employment-based immigration we mean skilled workers, professionals, and other workers who immigrate to enter into an employment contract with an employer in Finland.

reduced
a lot

increased
a lot

Humanitarian immigration should be:

> By humanitarian immigration we mean people have been persecuted or fear they will be persecuted on account of race, religion, nationality, and/or membership in a particular social group or political opinion.

reduced
a lot

increased
a lot

Next
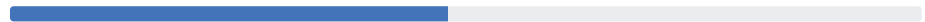
In this section, we ask about your views on various societal and political issues.

In Finland, there has been talk of introducing a basic income scheme. A basic income scheme is a social security system in which all citizens are paid a monthly income unconditionally to guarantee a minimum standard of living. It replaces many social benefits. The amount of basic income does not decrease as income from other sources increases. As income increases, the benefit derived from basic income is recovered through taxation. Would you be against or in favour of this kind of scheme?

Strongly against   Strongly in favor

Are you against or in favour of the idea that unemployment benefits should depend on job search effort during unemployment?

Strongly against   Strongly in favor

Next

In this section, we ask about your views on income redistribution. Economic redistribution means that the state, through taxes and subsidies, make income in society more equal between the citizens that would have been the case without these taxes and subsidies.

Do you agree with the following statement: "People should take full advantage of the tax code to minimize their tax burden."

Completely
disagree

Completely
agree

In your opinion, should there be more or less redistribution of income in Finland than there currently is?

A lot less
redistribution

A lot more
redistribution

In your opinion, what is the minimum disposable **monthly** income those worst off in Finland's society should have?

By disposable income, we refer to the total after tax monthly income which contains income from labor and capital, as well as transfers and subsidies like public unemployment payments and pensions (i.e. disposable income).

Please think of a household of one adult and no children. Use the text box below to write your answer.

euros

To tax inheritance means that those who inherit pay a certain percent of the inherited amount in tax. In Finland, spouses and direct heirs face a tax of 19% on each additional euro of inheritance after 1 million euros. Should this top inheritance tax rate be increased or decreased?

Kept the same

Decreased
a lot

Increased
a lot

Think of tax rate as the percentage of the total capital and labor income that an individual directly pays to tax authorities. (For example, if you receive 30 000 euros of capital and labor income in total and pay 3000 euros in income taxes, your income tax rate is 10 %.) Please use the slider below to tell us how much you think the highest earning 1% of Finns should pay as a percentage of their total income.

I think **%** of income of the highest earning 1% of Finns should be paid in income tax.

Next

In this section, we ask about your views on income redistribution. Economic redistribution means that the state, through taxes and subsidies, make income in society more equal between the citizens that would have been the case without these taxes and subsidies.

The figure below shows two alternative ways in which the incomes of all Finns might be distributed. Please examine the figure, and answer the question below it.
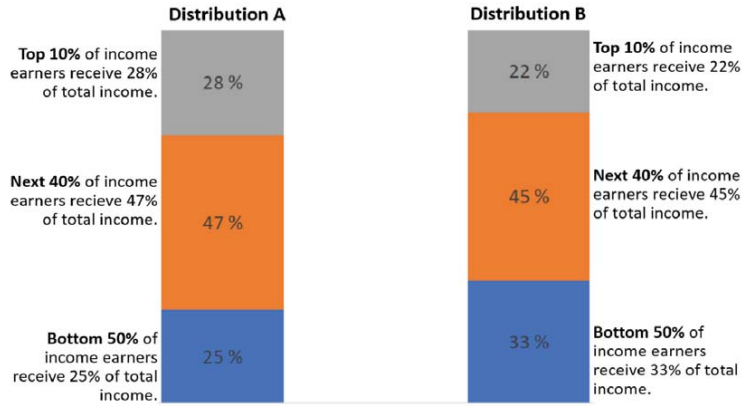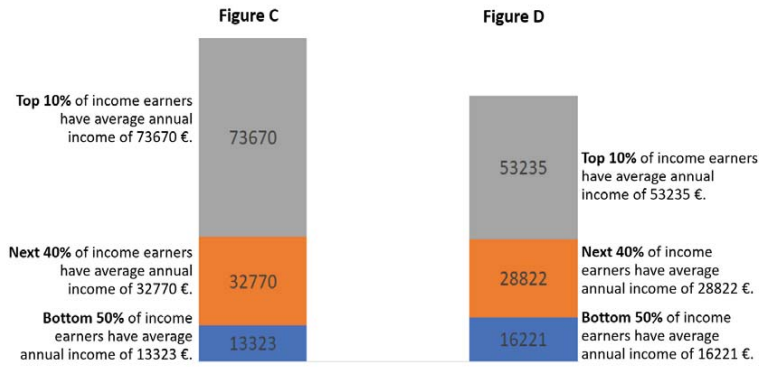

Which income distribution among Finns would you prefer?
Consider income as disposable income like in the rest of this survey.

○ Income distribution A
○ Income distribution B

Next

The figure below shows two alternative ways in which the incomes of all Finns might be distributed. Please examine the figure, and answer the question below it.

Figure C

Figure D

Top 10% of income earners have average annual income of 73670 €.

73670

Next 40% of income earners have average annual income of 32770 €.

32770

Bottom 50% of income earners have average annual income of 13323 €.

13323

53235

Top 10% of income earners have average annual income of 53235 €.

28822

Next 40% of income earners have average annual income of 28822 €.

16221

Bottom 50% of income earners have average annual income of 16221 €.

Which income distribution among Finns would you prefer?
Consider income as disposable income like in the rest of this survey.

○ Income distribution C

○ Income distribution D

Next
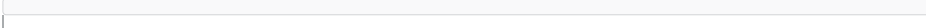
In this section, we ask about your views concerning opportunities in Finland.

To what extent do you think the following statements apply in Finland? Please tap the bars below to mark your answer.
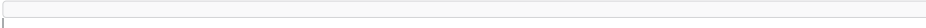
"Overall, everyone in Finland has a fair chance of getting the jobs they seek."

Does not apply
at all

Applies
completely
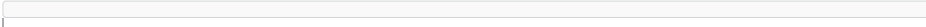
"Overall, everyone in Finland has a fair chance of achieving the level of education they seek."

Does not apply
at all

Applies
completely

Do you think hard work usually brings a better life, or is success more a matter of luck and connections? Please tap the bar to mark your answer.

Luck and
connections

Hard
work

Next

In this section, we ask how you would describe yourself. Please use the sliders to tell us how well the following statements describe you as a person.

"It is important to me to perform better than others on a task."

Does not describe
me at all

Describes me
perfectly

"If I am treated very unjustly, I will take revenge at the first occasion, even if there is a cost to do so."

Does not describe
me at all

Describes me
perfectly

"When someone does me a favor I am willing to return it."

Does not describe
me at all

Describes me
perfectly

"I enjoy working in situations involving competition with others."

Does not describe
me at all

Describes me
perfectly

"I assume that people have only the best intentions."

Does not describe
me at all

Describes me
perfectly

Next

In this section we ask about your willingness to act in a certain way. Please use the sliders below to indicate your answers.

How willing are you to give up something that is beneficial for you today in order to benefit more from that in the future?

Completely
unwilling

Very
willing

In general, how willing or unwilling are you to take risks?

Completely
unwilling

Very
willing

How willing are you to give to good causes without expecting anything in return?

Completely
unwilling

Very
willing

Next

In this section, we ask about your views on various societal and political issues.

In politics, people sometimes talk of "left" and "right" on economic matters. Where would you place yourself on this scale?

Left   Right

People sometimes talk of conservative and liberal values. Where would you place yourself on this scale?

Conservative   Liberal

Which party would you most likely vote for, if there would be an election today? (Parties are listed in alphabetical order.)

⌄

Next

THIS PAGE ONLY FOR TREATMENTS 2-6 AND TREATMENT 7

FOR NO-INCENTIVE: THE PARAGRAPH "IF THIS PARTICULAR GRUESS IS RANDOMLY SELECTED ..." IS DROPPED.

In this survey you received information about the relationship between your disposable income and the disposable incomes of those who lived in the same municipality in 2018.

According to your assessment, **68%** of people who lived in the same municipality had lower income than you in 2018.

Actually, based on register data, **50%** of people who lived in the same municipality had lower income than you in 2018.

— individual with highest income

— Your assessment: 68%

— Your actual position: 50%

— individual with lowest income
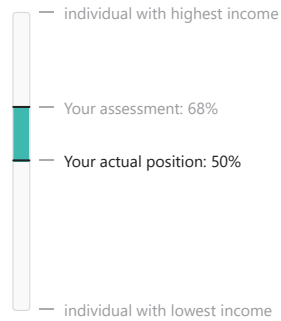
If this particular guess is randomly selected as the payoff relevant one, you would receive an additional 5 euros if your guess hit the correct 5%-point interval among 0-5%, 6-10%, 11-15%, ..., 91-95%, 96-100%. You will learn which guess was randomly chosen at the end of the survey. Notice yet that the guess above has only 20% chance of being randomly selected in which case you will be rewarded for this guess if correct. Each of the four other guesses may be randomly selected for payment as well.

Next

In addition to the potential payment for a correct guess, you also receive 15 euros for taking part in this survey.

We will now present you with three separate economic decisions, where you can decide to spend part of the payment that you received: *donation* to Save the Children charity, *voluntary* tax payment, and purchase of Veikkaus *Lotto* lottery tickets. **One of these three decisions will be randomly selected, and only that decision will be implemented.**

Here is the illustration of the random draw. The illustration may not work with some browsers, e.g. internet explorer; in that case you will see an empty space in place of the illustration.
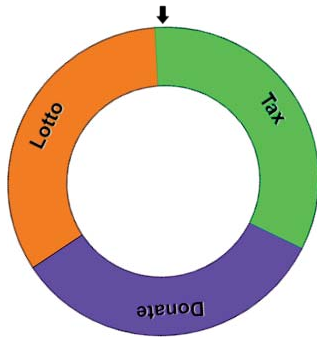
The random choice between Tax, Lotto, and Charity will happen in the final stage of the survey. There is an equal chance for each of the three causes to be selected. The amounts you spend in each decision have no effect on the selection.

Before the final stage, on the following page, we will ask you to indicate the amount (0, 5, 10 or 15 euros) that you would like to spend on Tax, Lotto, and Charity separately.

You can spend different sums of money, or not spend any money at all, in the three different decisions. For example, you could choose to spend 10 euros on Lotto, 10 euros on Tax and 10 euros on Charity. **There is no reason for these to add to 15, as only one of these will actually be implemented.**

Next

We will now present you with three separate hypothetical economic decisions: *donation* to Save the Children charity, *voluntary* tax payment, and purchase of Veikkaus *Lotto* lottery tickets.

On the following page, we will ask you to indicate the amount (0, 5, 10 or 15 euros) that you would like to spend on Tax, Lotto, and Charity separately.

You can spend different sums of money, or not spend any money at all, in the three different decisions. For example, you could choose to spend 10 euros on Lotto, 10 euros on Tax and 10 euros on Charity. **There is no reason for these to add to 15.**

These decisions are hypothetical and will not be implemented for real.

Next

Once you have marked the amounts that you would like to spend on Lotto, Tax and Charity and clicked NEXT, you will move to a new page where one of the decisions will be randomly selected and the sum you indicated will be spent accordingly on that cause. You will get to keep the rest of the 15 euros that you decided not to spend on that particular randomly chosen cause. In case Veikkaus Lotto is randomly selected, we will send you the lottery tickets by mail.

Please, indicate the amount (0, 5, 10 or 15 euros) that you would like use to buy Veikkaus *Lotto* lottery tickets if the Lotto decision is selected on the next page.

0	5	10	15

euros as lotto and euros as payment

Please indicate the amount (0, 5, 10 or 15 euros) that you would like to *donate* to Save the Children, and how much you would like to keep yourself if the donation decision is selected on the next page.
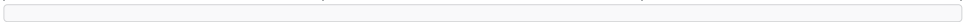
0	5	10	15

euros to Charity and euros as payment

Please, indicate the amount (0, 5, 10 or 15 euros) that you would like to pay as a *voluntary tax* to the Finnish state, and how much you would like to keep yourself , if the voluntary tax decision is selected on the next page.

0	5	10	15

euros as tax and euros as payment

Next

These decisions are hypothetical and will not be implemented for real.

Please indicate the amount (0, 5, 10 or 15 euros) that you would like to *donate* to Save the Children, and how much you would like to keep yourself.

0	5	10	15

euros to Charity and euros as payment

Please, indicate the amount (0, 5, 10 or 15 euros) that you would like to pay as a *voluntary tax* to the Finnish state, and how much you would like to keep yourself .

0	5	10	15

euros as tax and euros as payment

Please, indicate the amount (0, 5, 10 or 15 euros) that you would like use to buy Veikkaus *Lotto* lottery tickets .

0	5	10	15

euros as lotto and euros as payment
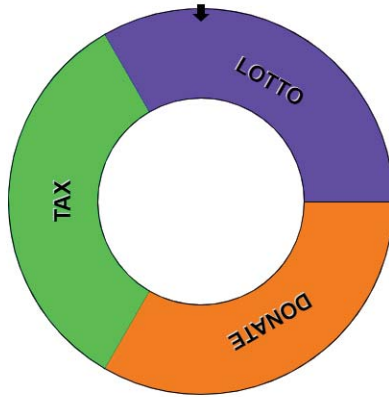
Next

Please press the "spin" button to carry out the random draw between the three causes Save the Children charity, voluntary tax donation, and Lotto tickets. The chosen cause will be indicated by the marker when the wheel stops.

The spin wheel may not work with some browsers, e.g. internet explorer; in that case you will see an empty space in place of the wheel. However, you may continue to finish the survey if you copy the link of this page to a different browser, or, you enter the survey link in a different browser, type your username and you will continue from this page.

spin

Next

Thank you for taking part in this study! You have now completed the survey.

The randomly drawn cause is VÄLGÖRENHET. The indicated amount 0 euro will be spent on VÄLGÖRENHET.

Your guess about the % of people among those who lived in the same municipality had lower income than you in 2018 was randomly selected. The actual % is 85. Your guess was 68.

You would receive an additional 5 euros if your guess hit the correct 5%-point interval among 0-5%, 6-10%, 11-15%, ..., 91-95%, 96-100%.

Your assessment does not hit the correct 5%-point interval and thus you will not receive 5 euros in addition.

In total, you will be sent 15 euros as a gift card for R-kioski by a text message to your mobile phone.

After this page you will get a link that directs you to a separate website at Statistics Finland, in which you may enter a mobile phone number. The experts at Statistics Finland will extract the information regarding your payment from the anonymous survey data sent to Statistics Finland. They then connect your payment data with the mobile phone number and send you the gift cards by text-message, and lottery tickets by mail.

To finalize the survey and receive your payment, click on this link, and follow the instructions on the Statistics Finland website.

THIS PAGE IS ONLY FOR NO-INCENTIVE.

Thank you for taking part in this study! You have now completed the survey.