

# Misperceptions About Others

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**Abstract**

Perceptions about others play an important role in shaping people's attitudes and behaviors, as well as social norms more broadly. This review presents a meta-analysis of the recent empirical literature that examines perceptions about others in the field, covering over a million observations for a total of 434 elicited perceptions. We document a number of stylized facts. Misperceptions about others are widespread, asymmetric, much larger when about out-group members, and positively associated with one's own attitudes. Experimental treatments to recalibrate misperceptions generally work as intended; they sometimes lead to meaningful changes in behaviors, though this often occurs only immediately after the treatments. We discuss different conceptual frameworks that could explain the origin, persistence, and rigidity of misperceptions about others. We point to several directions for future research.

## 1. INTRODUCTION

A long literature on peer effects, social learning, and coordination has established that people are influenced by friends, peers, and other members of society. In principle, people's perceptions about others should play an important role in these environments, and such perceptions could in turn shape people's own attitudes, behaviors, and social norms.

A recent and growing body of evidence has documented widespread misperceptions in a variety of settings. Across societies, individuals widely misperceive what others think, what others do, and even who others are. This ranges from perceptions about the size of immigrant population in a society to perceptions of partisans' political opinions to perceptions of the vaccination behaviors of others in the community. This review presents a meta-analysis of the recent empirical literature that has examined (mis)perceptions about others in the field.<sup>1</sup> What do misperceptions about others typically look like? What happens if such misperceptions are recalibrated?

We compile the recent empirical studies that elicit perceptions about others in the field. We cover 81 papers published over the past 20 years, amounting to 1,067,715 observations for a total of 434 elicited perceptions. These papers examine perceptions across a range of domains: economic topics, such as beliefs about others' income; political topics, such as partisan beliefs; and social topics, such as beliefs on gender.

We establish a number of stylized facts. First, we document four facts on the pattern of misperceptions. (a) Misperceptions about others are widespread across domains, and they do not merely stem from measurement errors. (b) Misperceptions about others are very asymmetric: Namely, beliefs are disproportionately concentrated on one side relative to the truth. (c) Misperceptions regarding in-group members are substantially smaller than those regarding out-group members. (d) One's own attitudes and beliefs are strongly, positively associated with (mis)perceptions about others' attitudes and beliefs on the same issues.

Second, we present three patterns on the effects of recalibrating misperceptions. (a) Experimental treatments to recalibrate misperceptions generally work as intended. (b) Treatments that are qualitative and narrative in nature tend to have larger effects on correcting misperceptions. (c) Although some treatments lead to important changes in behaviors, large changes in behaviors often only occur in studies that examine behavioral adjustments immediately after the interventions, suggesting a potential rigidity in the mapping between misperceptions and some behaviors.

The origin, persistence, and rigidity of misperceptions about others can in principle be explained by different conceptual frameworks, such as stereotyping (e.g., Bordalo et al. 2016), motivated reasoning (e.g., Benabou & Tirole 2016), and pluralistic ignorance (e.g., Kuran 1997; Bursztyn et al. 2020a,c). While this review is primarily empirical, we note that each of the major classes of models could predict (several of) the key patterns that we document. Most of the existing study designs do not allow one to adjudicate among these models.

We end with a discussion of important directions for future research. First, more work is needed to explicitly identify the sources of misperceptions and examine the patterns of misperceptions more directly in order to rule in and rule out existing theories. The patterns that we document may also generate the need for additional theoretical frameworks on the origin of misperceptions. Second, more work is needed to understand the different ways in which misperceptions could

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<sup>1</sup>This means that our review does not cover the large literature on misperceptions about others in laboratory settings. Important examples of lab studies include analyses of perceptions of gender stereotypes (e.g., Bordalo et al. 2019) and of voters' beliefs about others' behaviors in response to policy change (e.g., Dal Bó et al. 2018), in addition to work in the context of games of public goods contribution (e.g., Fischbacher & Gächter 2010) and of altruism and dictator games (e.g., Di Tella et al. 2015). Our review also does not cover misperceptions about facts (see Nyhan 2020 for a recent review on this topic).

be recalibrated and under what conditions such recalibrated misperception may actually lead to behavioral changes. Third, an important direction for future research is to consider the welfare implications of widespread misperceptions and of their correction: When should misperceptions be recalibrated, and how?

The remainder of this review proceeds as follows. Section 2 describes the scope of the meta-analyses; Section 3 presents stylized facts on the patterns of misperceptions about others; and Section 4 presents stylized facts on recalibrating such misperceptions. Section 5 concludes with a discussion of the potential future directions of research on this topic.

## 2. SCOPE OF THE META-ANALYSIS

We aimed to select, as comprehensively as we can, papers studying people's perceptions about others in the field that were published after 2000 and primarily in the disciplines of economics and finance.

Specifically, we began with a number of top journals in economics and finance (*American Economic Review*, *Quarterly Journal of Economics*, *Journal of Political Economy*, *Econometrica*, *Review of Economic Studies*, *American Economic Journal*, and *Journal of Finance*), as well as top working-paper repositories (NBER, IZA, SSRN, and EconPapers). We supplemented these outlets with a selected set of top journals in political science and psychology (*American Journal of Political Science*, *American Political Science Review*, *Political Analysis*, *Political Psychology*, and *Psychological Bulletin*). We conducted keyword searches on “beliefs,” “perception,” “bias,” “misperception,” “misbelief,” “impression,” and “evaluation,” and we screened out the papers manually to zoom in on the relevant topics. We then searched for the keywords “field experiment,” “quasi-experiment,” and “survey” to focus on papers that examined these topics in field settings. For each paper that we selected based on these criteria, we also reviewed the work cited by the authors and supplemented the list of papers to be included in the analyses. Importantly, our paper selection criteria was not explicitly and exclusively focused on misperceptions; rather, we aimed to include any papers that elicited beliefs about others in the field.

Overall, this yielded 81 papers that we include in this review. A subset of them, 53, are included in the primary components of the meta-analysis. This is because not all papers elicit the relevant variables needed for the meta-analysis, and not all papers provide sufficient replication data to calculate the necessary statistics. **Table 1** lists the papers included in the primary components of the meta-analysis; **Supplemental Table A.1** provides additional details on these papers; and finally, **Supplemental Table A.2** lists in addition the papers included in the review but not in the meta-analysis.

These papers cover a diverse set of topics. A large group of papers focuses on the domain of politics, ranging from beliefs about others' political opinions and partisan characteristics to beliefs about others' political participation behaviors to beliefs about politicians. Another large group of papers falls under the broad category of socioeconomics, and these focus on a range of beliefs about others' income, charitable giving choices, socioeconomic characteristics such as gender and race, perceived stigma regarding social programs, tax evading behaviors, and expectations on inflation. Finally, a sizable body of work focuses on beliefs about others concerning topics of education, gender, immigration, and health. **Supplemental Table A.3** presents counts of the papers and elicited beliefs across topics.

The labels identify the papers under discussion; please refer to **Supplemental Tables A.1 and A.2** for the full references.

Alongside the classification by topic domains, we can categorize the papers according to the types of beliefs about others that they study. They may focus on beliefs about others' opinions and

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**Table 1 Overview of papers included in the meta-analyses**

Label	Context	Primary beliefs	Treatment
A-14	Voters in California	Partisan differences in political opinions	Yes
ABL-20	Parents in Zambia	Daughter's ability and behavior	Yes
AMR-21	Households in Mozambique	Support for social distancing during COVID-19 pandemic	Yes
AMS-18	Nonimmigrants in European countries and the United States	Immigrants' characteristics	Yes
AMS-21	University staff members in Ethiopia	Female and male leaders' ability	Yes
AR-21	US representative sample	Stigma about food stamps	Yes
AS-18	A sample of US population	Party-stereotypical characteristics	Yes
BC-12	Poor families in Brazil	High school and college graduate wages	Yes
BCG-16	Self-identified liberals and conservatives in the United States	Partisan differences in political opinions	No
BFP-18	Married couples in India	Gender norms on women working	No
BGY-20	Married young men in Saudi Arabia	Women working outside of home	Yes
BLP-20	Taxpayers in Uruguay	Tax evasion behavior	No
BPT-20	Senior medical students in the United States	Position in the income distribution	Yes
BS-18	State legislative candidates in the United States	Public opinion about political issues	No
BTY-21	Self-identified liberals and conservatives in the United States	Partisan differences in political opinions	No
CGK-21	Firm managers in New Zealand	Inflation expectations	Yes
CH-21	US representative sample	Probability of voting for Trump	Yes
CPT-13	Households in Argentina	Share of low-income population	Yes
CPT-18	Employees at a Southeast Asian corporation	Peers' and manager's salary	Yes
CYY-17	Students at a university in Hong Kong	Antiauthoritarian attitudes	No
CYY-19	Students at a university in Hong Kong	Protest participations	Yes
DM-21	US sample	Donations	Yes
DR-19	Households in Malawi	Child's school performance	Yes
E-19	Students at universities in California	Returns to effort in language learning	Yes
F-18	Students at a university in California	Present bias	No
FHW-15	A sample of villagers in Liberia	Project contribution	Yes
FM-04	University students in Switzerland	Donations	Yes
FMP-19	Germany representative sample	Position in the income distribution	Yes
GHM-20	US representative sample	Closeness of elections, voting for Democratic or Republican governor	Yes
GNH-12	US online sample	Partisan moral values	No
GRU-20	US online sample	Immigrants' characteristics	Yes
HFM-19	Senior legislative staff in the United States	Constituents' political opinions	Yes
HHH-19	Party supporters in a Western European country	Canvassing behavior during election campaign	Yes
HNO-20	CEOs and non-CEOs in China	CEOs' and non-CEOs' strategic decisions	Yes
HSC-18	Non-Hispanic Americans	Size of immigrant population	Yes
JO-09	Women in five Indian states	Women's status: acceptability of wife beating	Yes
JO-20	Denmark representative sample	Immigrant's characteristics	Yes
K-21	Parents in Sierra Leone	Child vaccination	Yes

(Continued)

Table 1 (Continued)

Label	Context	Primary beliefs	Treatment
KNT-15	Voters in Italy	Politicians' ideology and competence	Yes
KP-21	US representative sample of parents	Child's reading and math skills	No
LM-16	US representative sample	Partisan differences in political opinions	No
LMB-13	Male students at a US university	Hand-washing behavior	Yes
LPR-20	Taxpayers in Peru	Donations	Yes
LS-14	US sample	Population characteristics	Yes
MT-19	Chinese and US samples	Climate change: beliefs and policy opinions	No
N-18	US representative sample	Global income distribution	Yes
RF-18	High-risk students in the United States	Child's school absences	Yes
RLD-18	Parents in school districts on the US West Coast	Child's school absences	Yes
RVB-21	A sample of European and North American populations	Negative perceptions	Yes
TS-18	Students at a US university	Students' mental health	Yes
W-20	US representative sample	Muslims' patriotism, attitudes towards Muslims	Yes
WZ-15	Students at a US university	Income depending on gender and college major	Yes
Y-19	Mozambique representative sample	HIV stigma	Yes

attitudes (e.g., political attitudes, gender norms), beliefs (e.g., about others' beliefs about people using food stamps), characteristics (e.g., race, income), and actions (e.g., voting, charitable giving, behavior in strategic games). **Supplemental Table A.4** presents counts of the papers and elicited beliefs across types.

Beliefs about others can also be differentiated based on the target groups with respect to whom the beliefs are elicited. Whereas some papers focus on beliefs about a general population (e.g., about the racial composition of the US population), the majority of papers focus on beliefs about a specific in-group or out-group from the perspectives of the respondents. For example, Bursztyn et al. (2020c) focus on beliefs of men about other men's opinions (in-group), and Alesina et al. (2018) study perceptions of a native population about immigrants (out-group). A number of papers contrast beliefs about in-groups and out-groups. For example, Graham et al. (2012) measure the perceptions of Democrats and Republicans about their respective in-groups' and out-groups' political opinions. **Supplemental Table A.5** presents counts of the papers and elicited beliefs by targets.

Moreover, we note that the papers we review represent a variety of methods in eliciting beliefs about others. One methodological dimension relates to the incentives given for reporting perceptions accurately and truthfully. Certain papers elicit perception in an incentivized manner. For example, Cantoni et al. (2019) incentivize the elicitation of beliefs, rewarding respondents if their reported beliefs are within a certain distance from the truth. Other papers refrain from incentivizing belief elicitation. **Supplemental Table A.6** presents counts of the papers and elicited beliefs depending on whether the elicitation involves incentives. A second methodological dimension concerns the units of measure of the perception. Many papers measure perceptions about shares, for example, perceptions about the share of people having a certain characteristic, agreeing with a statement, or taking an action. Another set of papers measures perceptions as absolute values, for example, perceptions about others' (average) political opinions on ordinal scales or others' income. A few papers measure perceptions as binary indicators. For example, Kinsler & Pavan (2021) study beliefs regarding whether children's school performance is above

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average. We will examine whether patterns of beliefs about others depend systematically on the methods underlying belief elicitation. **Supplemental Table A.7** presents counts of the papers and elicited beliefs by units of measure.

Finally, the examined papers use various methods to assess changes in beliefs about others. A substantial share of papers implement experimental treatments explicitly aimed at changing respondents' beliefs about others (as indicated by the last column in **Table 1** and reviewed in Section 4). The experimental designs vary across papers, ranging from eliciting beliefs both before and after the treatment (thus allowing for within-subject comparisons) to eliciting only the beliefs of treated subjects after the treatment (thus being constrained to between-subject comparisons), potentially to mitigate anchoring and other unintended effects. Whereas a number of papers aim to use experimental treatments to study the effects of belief manipulation about others on downstream behaviors, several studies focus exclusively on the effects of treatments on the beliefs themselves. For example, Jørgensen & Osmundsen (2022) study how information provision about non-Western immigrants' welfare dependency rate, crime rate, and population share affects respondents' opinions about immigrants; Jensen & Oster (2009) study how the access to cable TV changes women's acceptability of domestic violence. **Supplemental Table A.8** presents counts of the papers that involve treatment interventions, and **Supplemental Table A.9** presents counts depending on whether beliefs are elicited before and/or after the treatments.

Beliefs are the unit of analysis in our meta-analysis, and we aim to achieve a balanced representation of papers.<sup>2</sup> We distinguish primary and secondary beliefs for each paper based on its focus, and we restrict the main analysis to the primary beliefs in cases in which multiple beliefs are elicited. The patterns we present remain unchanged if we include secondary beliefs as well (see **Supplemental Figures A.1–A.3**).

### 3. PATTERNS ON MISPERCEPTIONS ABOUT OTHERS

#### 3.1. Misperceptions About Others Are Widespread

We begin by examining the prevalence of misperceptions about others across the papers in which beliefs about others are elicited.

We define the main measure of (mis)perceptions based on the distribution of perceptions relative to the true value, that is, the share of correct beliefs, allowing for a range of 0.5 standard deviations around the truth for noise. This measure provides a harmonized metric of misperceptions across papers, in particular given the diverse ways in which beliefs about others are elicited, as described in Section 2. Such a measure does not depend on the specific directions along which beliefs about others are measured. For example, when eliciting beliefs about others' support for universal health care, survey questions may ask about the share of population with high support or low support. Moreover, this measure of misperceptions does not depend on the unit of measurement either. For example, some studies elicit beliefs regarding shares of the population, and others elicit beliefs regarding the absolute size of certain groups. Alternative measures of misperceptions using different ranges around the truth yield results that are very similar to what we will describe next (see **Supplemental Figure A.4**).

Note that this measure of misperceptions requires that perceptions about others be elicited and the corresponding truth be known. The truth can be of either an objective or a subjective

<sup>2</sup>Our meta-analysis includes comparable numbers of studies for each major class of beliefs about others. However, the number of beliefs differs substantially across types. For example, papers on beliefs about others' opinions elicit many more beliefs than papers on beliefs about others' characteristics and actions.

nature. For example, perceptions of a population's racial composition have an objective truth, that is, the population shares of each race group as reported in census data. In the case of perceptions of other people's opinions, the truth refers to the relevant populations' reported opinions (e.g., the average level of the opinions). These requirements limit the perceptions included in the analyses to those with a measurable and measured truth.

**Figure 1** presents the distribution of the share of respondents holding correct perceptions across the primary beliefs about others elicited in the papers. The papers (and their primary beliefs) are ordered in descending fashion with respect to the share of respondents holding correct perceptions about others. One can see that the misperceptions about others are prevalent and generally large in magnitudes. In only 20% of the beliefs the share of respondents who hold correct perceptions about others (i.e., within a 0.5 standard deviation of the truth) exceeds 50%. In more than 30% of the beliefs, more than three-quarters of the respondents hold beliefs that are at least a 0.5 standard deviation away from the truth.<sup>3</sup>

It is important to note that misperceptions about others are prevalent in the papers we analyzed, despite the fact that misperception was not an explicit criterion for papers' inclusion. Papers were included in our analyses as long as they elicit beliefs about others. This could be reflecting the genuine phenomenon that misperception is widespread. However, it is also likely that the published papers are implicitly selected on documenting misperceptions. It is difficult to speculate whether the domains that are not covered by the existing literature may exhibit similar patterns of widespread misperception or not. Whereas many important domains have already been studied by the current literature, more work is needed to explore whether there exist clusters of beliefs that are well calibrated among the population.

Another important aspect of the interpretation of misperception patterns is that our analyses, similarly to what is done by the vast majority of the literature, take the distribution of the respondents' own characteristics, attitudes, preferences, beliefs, and actions as the truth. Accordingly, beliefs about others that deviate from such truth are considered misperceptions. Whereas this is uncontroversial when the truth is objective (e.g., beliefs about the population's demographic characteristics), at least in some domains where stigma and social desirability biases are extensive, respondents' answers about others may be more reflective of the truth than the stated answers about themselves. Several works explicitly deal with issues related to stigma and social desirability biases that may affect survey responses and find that this is not a primary concern (e.g., Cantoni et al. 2019, Bursztyjn et al. 2020c); however, others have found it to be relevant for particular contexts, such as social distancing behaviors during the COVID-19 pandemic (Allen et al. 2021).

### 3.2. Misperceptions Are Not Merely Measurement Error

Given the prevalence of misperceptions documented by the existing literature, one naturally wonders whether the elicited misperceptions may simply be noises when respondents report their perceptions about others. Note that our baseline measure of the proportion of respondents holding incorrect beliefs already accounts for answers reasonably close to the truth that may be due to measurement errors.<sup>4</sup>

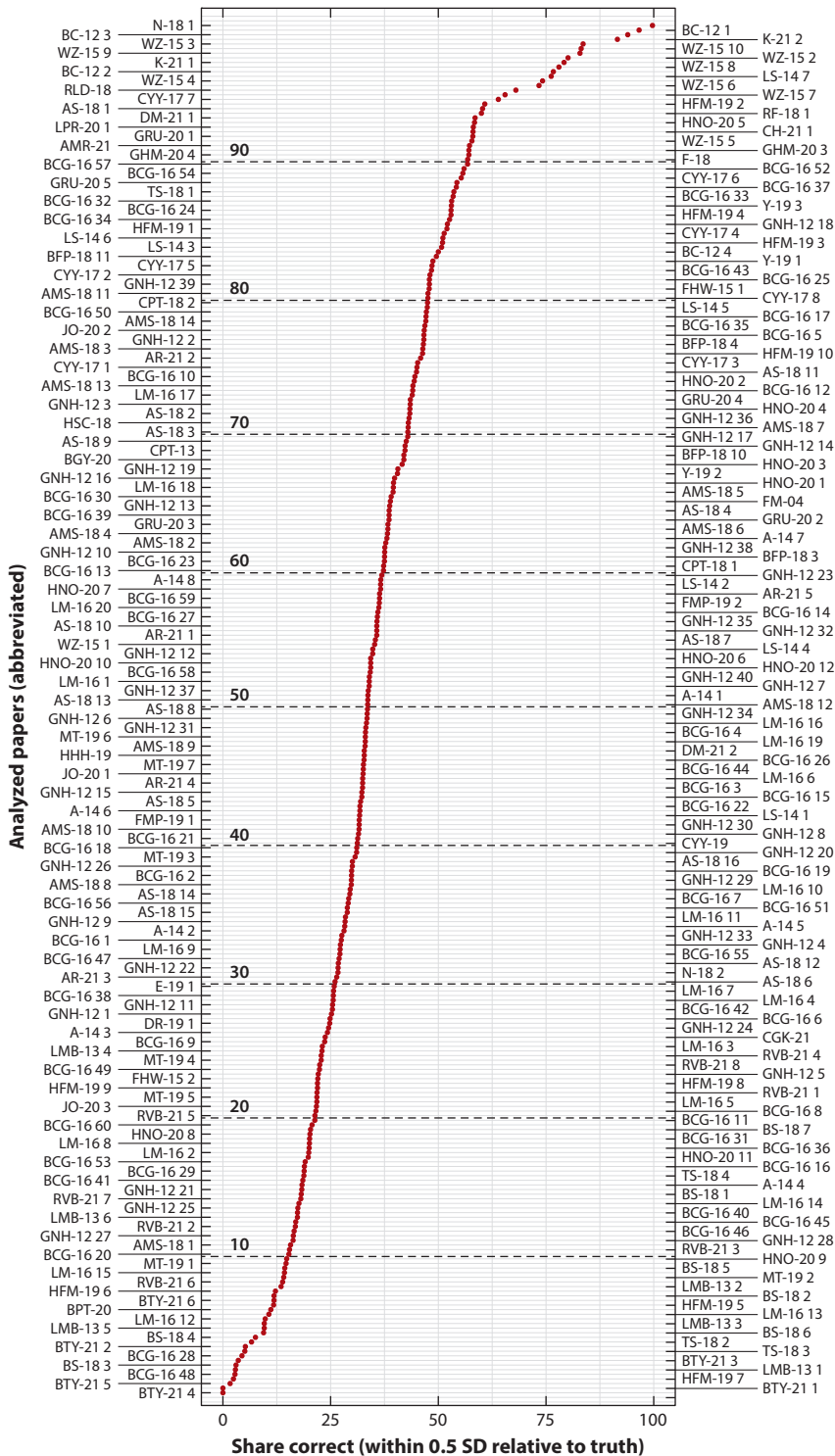
We provide two more pieces of evidence from the meta-analyses to support the hypothesis that the prevalent misperceptions about others documented in the literature are not merely

<sup>3</sup>Interestingly, for a few belief dimensions, the share of respondents holding correct perceptions is high and even close to 100%. These are primarily perceptions about others' income, regarding which the truth has large standard deviations, and thus our baseline correct perception metric becomes very conservative.

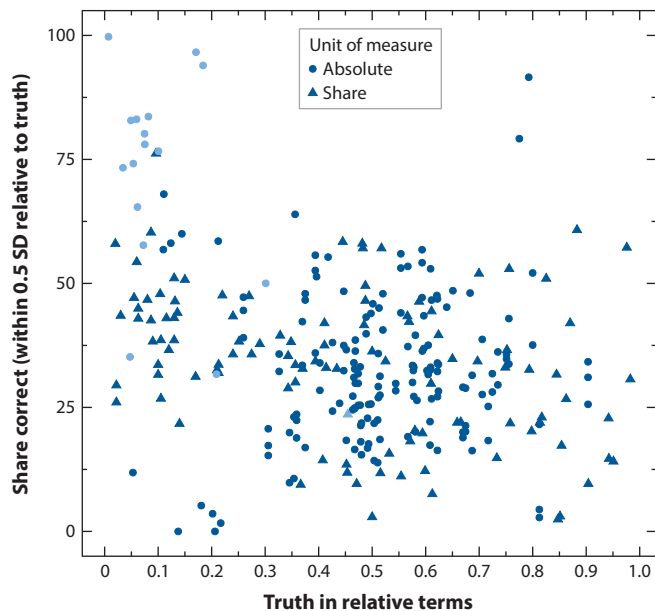
<sup>4</sup>We also find that the share of respondents holding correct perceptions is uncorrelated with the number of observations in the study (p-value = 0.478).

**Figure 1**

The figure shows the distribution of misperceptions across the papers we analyzed (indicated by abbreviations; please refer to **Supplemental Tables A.1 and A.2** for the full references). We measure misperceptions as the share of perceptions within 0.5 SD of the truth. Dashed black lines indicate deciles. Abbreviation: SD, standard deviation.







**Figure 2**

The figure shows the share of correct perceptions (allowing for 0.5 SD around the truth) and the truth in relative terms. For perceptions with an infinite range of possible values, we restrict the scale by defining a reasonable maximum (i.e., the maximum reported perception that is not clearly an outlier). These beliefs are represented by the lighter dots. Abbreviation: SD, standard deviation.

measurement errors. First, we examine whether the share of respondents holding correct beliefs (again, allowing for a window of error of 0.5 standard deviation from the truth) is associated with the underlying level of the truth. When the truth is measured in absolute terms, we transform it into a percentage scale relative to the range of feasible values (i.e., the minimum and maximum possible values for beliefs with a finite minimum and maximum). For beliefs with an infinite minimum or maximum (e.g., beliefs about the global average income), we limit the range to a reasonable value set as the maximum belief excluding outliers in the data. **Figure 2** plots the share of respondents holding correct beliefs against the corresponding truth in the context of any given study. Apart from the cluster of studies that focus on beliefs about others' income, where the truth levels are low in relative terms (see the gray circles in **Figure 2**), one does not observe overt patterns in the relation between the level of misperceptions and the underlying truth levels. In particular, there is no evidence that the share of respondents reporting correct beliefs about others significantly increases when the truth is around the midpoint of the distribution, due to reasons such as survey respondents' inattention or cognitive uncertainty (Enke & Graeber 2020).<sup>5</sup>

Second, we find that the methods by which beliefs about others are elicited do not affect the magnitude of misperceptions. In particular, the share of respondents holding incorrect beliefs does not seem to depend systematically on whether beliefs about others are elicited in relative terms (e.g., as percentage; these studies are marked as triangles in **Figure 2**) or in absolute levels

<sup>5</sup>In a few studies that elicit respondents' confidence in their reported perceptions (Nair 2018, Fehr et al. 2019, Bursztyn et al. 2020c), those who are more confident are indeed more likely to hold correct perceptions about others.

(marked as circles). In **Supplemental Figure A.5**, we also show that the share of respondents holding incorrect beliefs is not systematically related to whether belief elicitation is incentivized. These patterns suggest that the elicited beliefs about others and the corresponding degree of misperceptions are unlikely to be driven by the artifacts of specific measurement choices and the differential levels of measurement errors associated with these methods.

Taken together, these patterns indicate that the misperceptions about others exhibited across papers in the recent literature likely reflect genuine, meaningful discrepancies between respondents' beliefs about others and reality. The patterns of misperceptions that we describe in the following sections, such as the shape of their distributions discussed in Section 3.3, also suggest that symmetric noises in general are unable to account for the observed misperceptions. Moreover, the fact that in most papers respondents' beliefs about others are strongly associated with behaviors and other related attitudes suggests that the elicited misperceptions are in general capturing meaningful variations across people. It is thus worth understanding the causes and consequences of such misperceptions.

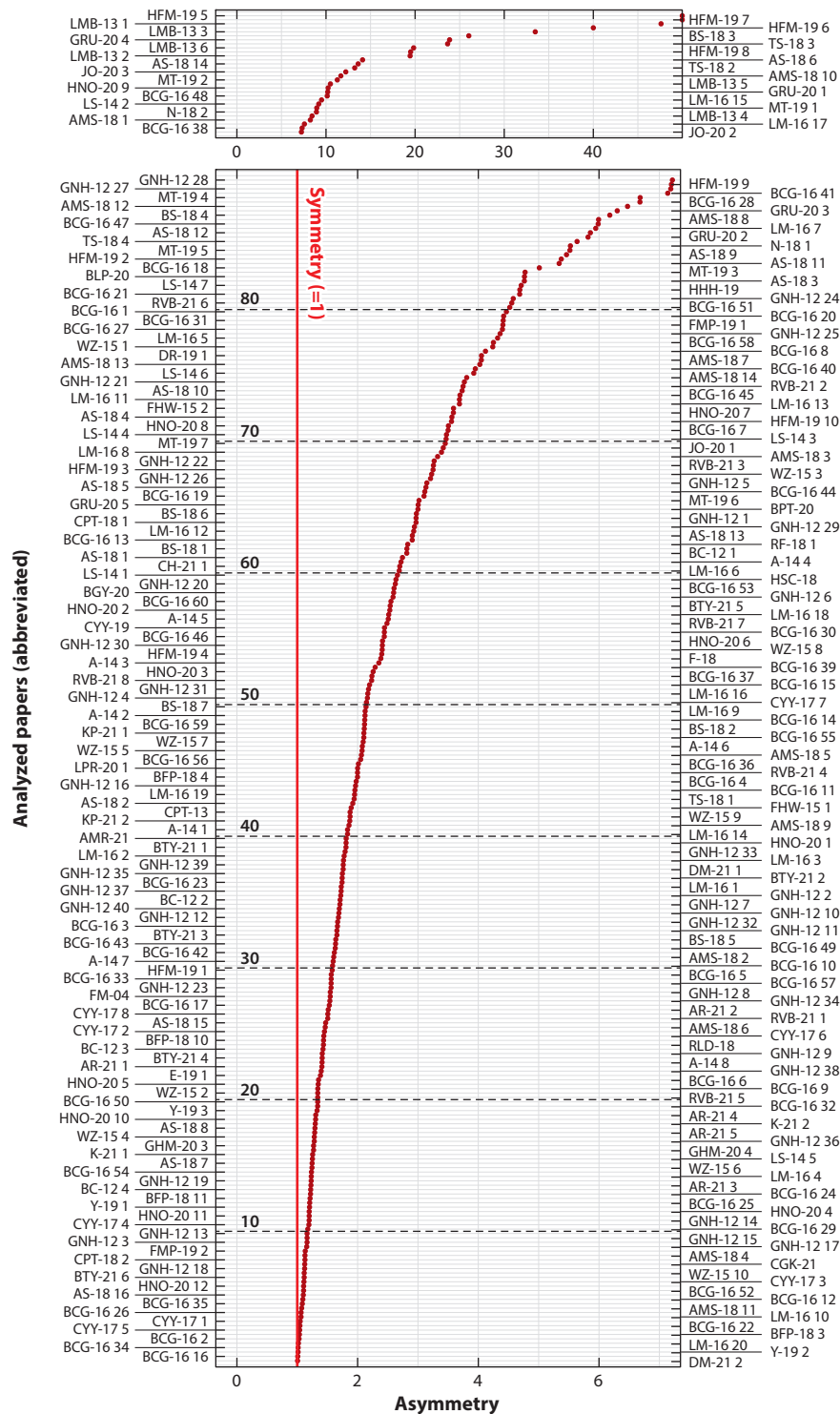
### 3.3. Misperceptions About Others Are Very Asymmetric

We next examine the patterns of misperceptions about others, focusing first on the distribution of beliefs underlying such misperceptions. Are the incorrect beliefs that constitute misperceptions about others symmetrically distributed around the truth?

We define asymmetry of misperceptions as the ratio between the share of respondents on one side of the truth and that on the other side. We always take the larger share as the numerator and the smaller share as the denominator, regardless of whether the corresponding beliefs are underestimating or overestimating the truth. Thus, a ratio equal to one indicates exact symmetry, and the higher the ratio, the larger the underlying asymmetry. Such a measure of asymmetry does not require one to take a directional stance regarding overestimating and underestimating the truth, preventing potential confusion caused by the different phrasing of beliefs across papers. For example, the asymmetry measure remains unchanged no matter if the perception of a political opinion is phrased such that overestimation refers to a more liberal or a more conservative position.

**Figure 3** presents the distribution of the asymmetry of misperceptions across papers, where vertical lines split the asymmetry distributions into deciles. The top decile is presented separately in the top panel due to scaling. Overall, misperceptions about others are asymmetrically distributed, and such asymmetry is large in magnitude. For example, in Europe there are 3 times as many people who overestimate the share of immigrants as people who underestimate it, and this ratio rises to more than 11 in the United States (Alesina et al. 2018). In fact, only about 10% of the papers find misperceptions about others to be symmetrically distributed around the truth, with approximately an equal share of respondents holding beliefs above and below the truth. About 80% of the papers find misperceptions with asymmetry measure greater than 1.5, that is, the number of respondents who fall on one side of the truth is greater than the number of respondents on the other side by at least 50%; and for almost half of the papers, the asymmetry measure is greater than 2.5, that is, the number of respondents who fall on one side of the truth is greater than the number of respondents on the other side by at least 150%. This pattern of asymmetry is robust to alternative measures; for example, we omit correct perceptions (again allowing for different ranges around the truth as in Section 3.1) when constructing the asymmetry ratios, and the results are presented in **Supplemental Figure A.6**.

The prevalence of asymmetry in misperceptions is unlikely to be driven by publication bias. While many papers feature misperceptions, most papers that we examine do not explicitly mention the asymmetry of such misperceptions.



**Figure 3**

The figure shows the distribution of asymmetry across the papers we analyzed (indicated by abbreviations; please refer to **Supplemental Tables A.1 and A.2** for the full references). Asymmetry is defined as the ratio of overestimates to underestimates, using the larger share as the numerator and the smaller share as the denominator. Dashed black lines indicate deciles.

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What may account for such prevalence of asymmetry in misperceptions about others? One may suspect that such asymmetry mechanically appears when truth moves away from the midpoint of the scale. For example, there may be greater asymmetry in misperceptions if the truth level is 80% than if the truth is 50%. However, we find that asymmetry in misperceptions is not merely a result of the underlying magnitude of truth: The degree of asymmetry is largely uncorrelated with the place that truth occupies along the distribution (see **Supplemental Figure A.7**).<sup>6</sup>

A number of demand-side mechanisms emphasized in the literature could generate systematic asymmetry in misperceptions about others. They include: (a) stereotyping, whereby beliefs are systematically shifted toward the direction that is more representative in terms of the tail likelihood (see, e.g., Bordalo et al. 2016); (b) projection bias, whereby when one's own attitudes are asymmetrically distributed, perceptions about others projected from those attitudes are asymmetric as well (e.g., Madarász 2012);<sup>7</sup> and (c) pluralistic ignorance, in particular due to social stigma and political pressure. If such stigma and pressure concern expressions of attitudes in one particular direction, the resulting misperceptions about others due to pluralistic ignorance could become asymmetrically concentrated toward that direction as well (e.g., Bursztyn et al. 2020a,c; Braghieri 2021). While the patterns of asymmetry alone do not allow one to distinguish among these mechanisms, stereotyping could result in asymmetry in misperceptions about others under all circumstances, whereas other mechanisms described above would generate asymmetry only under certain conditions.

Important supply-side factors could also contribute to the asymmetric misperceptions that we observe across papers, and this may be especially relevant in the domain of politics.<sup>8</sup> The average biases and slants in the media on both sides of the political spectrum may not cancel each other out in the aggregate, and the asymmetric misperceptions about others among the citizens could reflect the underlying supply-side asymmetry in media content. In particular, media on one side of the political spectrum might be particularly effective in affecting audience's beliefs about others, resulting in an overall asymmetry in voters' misperceptions. It is also important to note that such an asymmetric media landscape might also interact with the demand-side forces discussed above, which could in turn further foster asymmetric misperceptions. A particularly salient environment where demand-side and supply-side forces intersect is social media, where studies have shown that content exposures could substantially affect individuals' views toward others (Allcott et al. 2020, Bursztyn et al. 2020b, Levy 2021). Disentangling these mechanisms on both the demand and supply sides and understanding how they interact would be important directions for future research.

### 3.4. Misperceptions About In-Groups Are Substantially Smaller Than Those About Out-Groups

We next examine if the patterns of misperceptions about others differ depending on whether the targets of the beliefs are in-group or out-group members of the respondents' social groups.

<sup>6</sup>Most studies do not feature elicitation of misperceptions along multiple directions. In one exception, Alesina et al. (2018) elicit perceptions about the prevalence of both highly educated and lowly educated immigrants; one observes asymmetry, with many more respondents underestimating immigrants' education level regardless of the ways the questions are asked.

<sup>7</sup>Motivated reasoning could complement projection bias under certain circumstances—for example, when the beliefs that others are similar to oneself provide additional utility. Readers are referred to Robbins & Krueger (2005) for a review of the social psychology literature on this topic.

<sup>8</sup>A large literature in economics and political science has been devoted to studying the impact of media biases on citizens' political beliefs and behaviors, and we cannot survey this vast literature here.

In order to capture the difference between groups and not confound it with differences across dimensions of misperceptions, we compare misperceptions regarding in-group members and those regarding out-group members within a particular belief dimension. For example, we compare the perceptions of Democrats about other Democrats' (in-group) and Republicans' (out-group) political opinions. This requires the studies to elicit both in-group and out-group perceptions, and the analyses in this section are thus limited to the following papers: Graham et al. (2012), Ahler (2014), Wiswall & Zafar (2015), Bordalo et al. (2016), Levendusky & Malhotra (2016), Ahler & Sood (2018), Mildenerger & Tingley (2019), and Cullen & Perez-Truglia (2022). This set of papers focuses on the domain of politics, and five of them cover perceptions of Democrats and Republicans about each other.

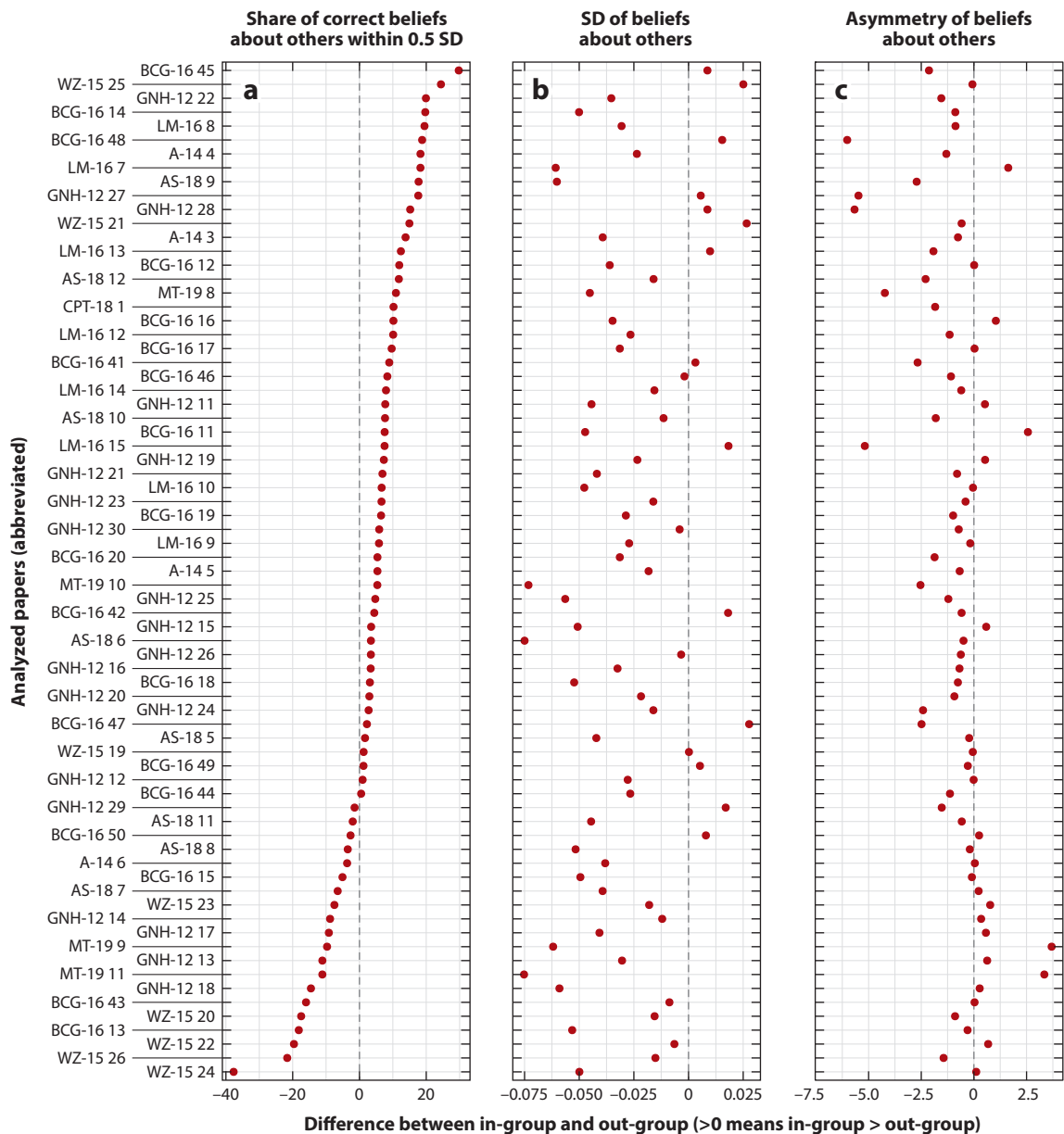
**Figure 4** presents comparisons of misperceptions about in-group members and out-group members. We focus on three aspects of such comparisons: the size of misperceptions, measured as the share of respondents holding correct perceptions about others, using the metric described in Section 3.1 (panel *a*); the spread and variation in perceptions about others, measured by the standard deviation of the corresponding perceptions (panel *b*); and the asymmetry of perceptions, measured by the ratio of respondents who fall on either side of the truth, using the metric described in Section 3.3 (panel *c*). Along each of these three aspects, we plot the in-group versus out-group differences: a positive number in panel *a*, for example, would indicate a higher share of respondents holding correct beliefs about in-group members compared to out-group members along the same belief dimension.

We observe that perceptions about in-group members are systematically better calibrated, less disperse, and less asymmetric. For example, Democrats are 42% more likely than Republicans to correctly estimate the share of Democrats who are atheists or agnostics; their beliefs are less diffused and much less concentrated on one side of the truth (Ahler & Sood 2018). Among more than half of the belief dimensions, more respondents hold correct beliefs about their in-group members than about out-group members. Moreover, beliefs about out-group members tend to exhibit greater spread across respondents than those about in-group members, suggesting that perceptions about in-group members are not only more accurately calibrated on average but also more tightly calibrated around the truth. Finally, we find that perceptions about in-group members are much more symmetrically distributed around the truth compared to those about out-group members. Intriguingly, we do not observe an obvious pattern between the differences in average in-group versus out-group misperceptions and the differences in their spread. On the other hand, the greater the in-group versus out-group difference in the shares of respondents holding correct perceptions, the bigger is the difference in the underlying asymmetry of the perceptions.

**Supplemental Figure A.8** plots the correlations across in-group versus out-group differences in average misperceptions, spread of beliefs, and asymmetry of the misperceptions.

Current research does not provide sufficient empirical evidence to distinguish among the mechanisms underlying in-group versus out-group differences in misperceptions. This is an important direction for future research, not least because distinct avenues may be effective in reducing those misperceptions, depending on the mechanisms that drive them. If the misperceptions about others, especially when the target of inference is out-group members, are driven by (rational) inattention, then direct information provision could be effective in reducing the misperceptions. To the extent that social interactions are much more abundant among in-group members than among out-group members due to segregation, homophily in social networks, or online filter bubbles (e.g., Glaeser 2005, Gentzkow & Shapiro 2011), inducing greater social contact with and consumption of information regarding out-group members may serve to mitigate misperceptions (e.g., Bursztyn et al. 2021, Schindler & Westcott 2021). However, simply increasing social interactions may not be effective and could even generate backlash, if perceptions about out-group

Supplemental Material >



**Figure 4**

The figure displays the differences between perceptions about the in-group and about the out-group in the papers we analyzed (indicated by abbreviations; please refer to **Supplemental Tables A.1 and A.2** for the full references). Panel *a* shows the share of beliefs within 0.5 SD of the truth. Panel *b* shows the SD of beliefs rescaled by the possible values. Panel *c* shows asymmetry, defined as the ratio of underestimates to overestimates, using the larger share as the numerator and the smaller share as the denominator. Abbreviation: SD, standard deviation.

members are associated with identity-based motives (e.g., Bonomi et al. 2021) and affective politics (e.g., Iyengar et al. 2019). Furthermore, the very concepts of in-group and out-group may be endogenously determined, based on factors such as individuals' immediate surroundings, changes in the presence of outsiders, and the socioeconomic or cultural dimensions on which identity is defined.

### 3.5. Attitudes and Beliefs About Oneself Are Strongly, Positively Associated with Misperceptions About Others

Finally, we examine whether misperceptions about others are systematically associated with one's own attitudes, beliefs, and behaviors. For example, is one's own opinion about a certain policy correlated with the perception of others' opinions about that same policy?

We focus on papers that report both perceptions about others (characteristics, attitudes, beliefs, and behaviors) and the corresponding characteristic, attitudes, beliefs, and behaviors of the respondents themselves. This limits our sample to 17 papers. To get a measure of correlation that is comparable across papers, we standardize both respondents' perceptions and characteristics and calculate the correlation between the standardized measures.

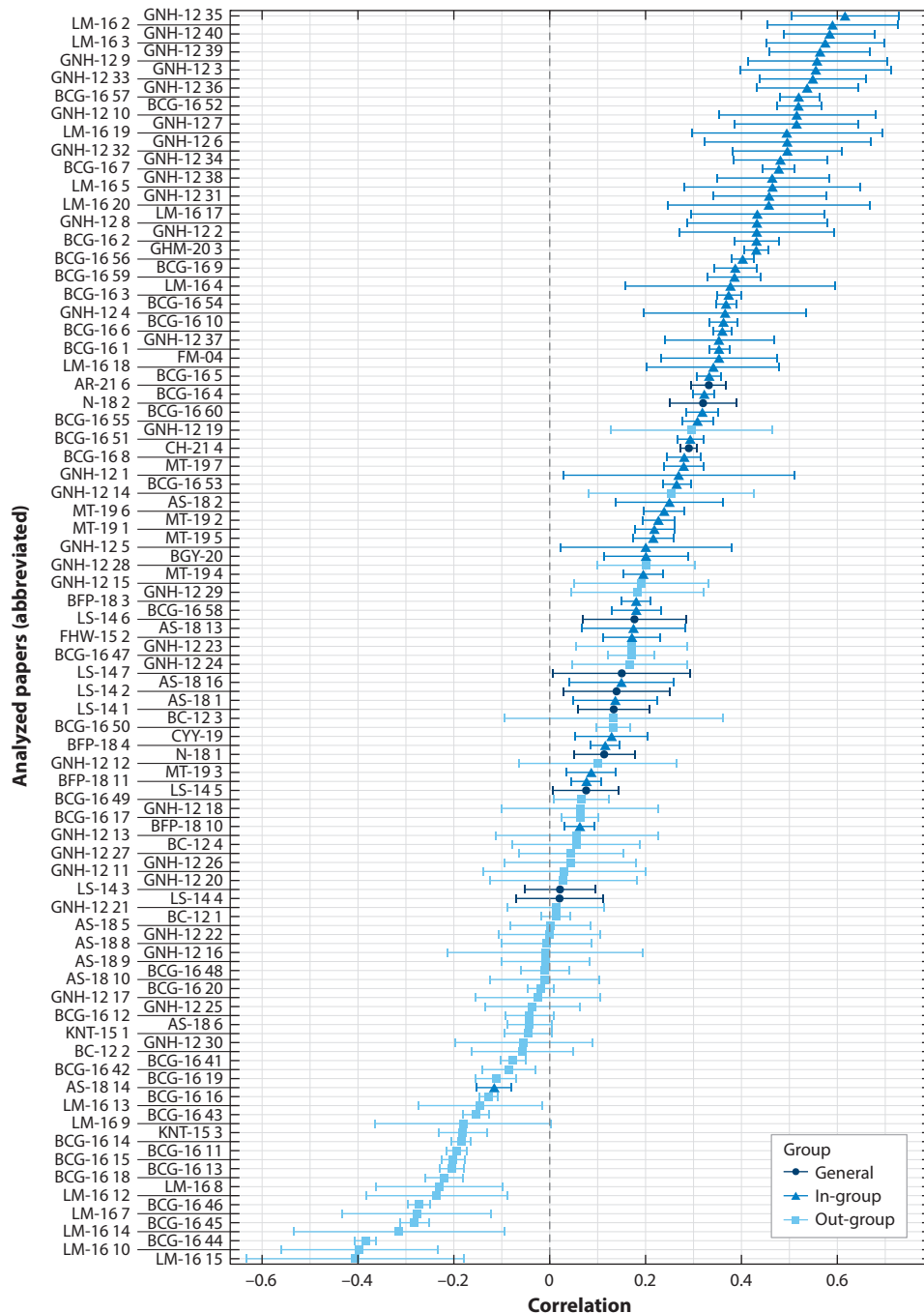
We regress each dimension of the perceptions about others on the corresponding characteristic, attitude, belief, or behavior of the respondents themselves. **Figure 5** presents the correlation coefficients as well as the 95% confidence interval of the estimates. In the majority of papers and for the majority of the beliefs that are elicited, we observe that attitudes, beliefs, and behaviors of one's own are strongly and positively associated with beliefs about others in the same dimension. For example, the correlation between students' donation to a charitable fund and their beliefs about the share of other students who donated is 0.38 (Frey & Meier 2004).

We then analyze whether this pattern differs depending on whether the perceptions concern in-group or out-group members. We use the same classification criteria as described in Section 3.4. For papers that elicit beliefs only about one group, we judge whether the targets of the beliefs are the relevant general population given the focus of the paper (e.g., the perceived share of people in Uruguay evading taxes, as in Bergolo et al. 2020) or members who share characteristics with the respondents (e.g., men's perceptions of other men's support for women working outside the home, as in Bursztyn et al. 2020c). Correlation coefficients related to perceptions about in-group members are indicated by triangles in **Figure 5**, and those about out-group members are indicated by squares. We observe that when perceptions concern out-group members, the correlation between one's own attitudes, beliefs, and behaviors and the corresponding perceptions about others turns significantly negative.

Taken together, these patterns indicate that respondents overwhelmingly tend to think that other in-group members share their characteristics, attitudes, beliefs, or behaviors, whereas they perceive out-groups members as the opposite of themselves.

Several mechanisms could account for the patterns observed here. Projection bias in general (e.g., Madarász 2012), and the curse of knowledge in particular (e.g., Camerer et al. 1989), would predict a strong correlation between one's own attitudes, beliefs, and behaviors and the corresponding beliefs on others. Note that, however, the most generic form of projection bias would not be able to account for the opposite patterns characterizing beliefs about in-group and about out-group members. Another mechanism consistent with these patterns is motivated reasoning. Beliefs about others could become associated with one's own attitudes when one derives positive utility from holding beliefs that in-group members are aligned with one's own attitudes and preferences, and out-group members hold the opposite ones (e.g., Bonomi et al. 2021).

By presenting the correlation coefficients, we do not take a stance (and neither does much of the existing literature) on the direction of causation. Mechanisms such as projection bias and



**Figure 5**

The figure shows the correlation between perceptions about others' characteristics/opinions/actions and one's own characteristics/opinions/actions (both standardized), with 95% confidence intervals based on robust standard errors. Triangles, squares, and circles represent perceptions about one's in-group, one's out-group, and the general population, respectively. The papers are indicated by abbreviations; please refer to **Supplemental Tables A.1 and A.2** for the full references.

**Supplemental Material** >



motivated reasoning imply that one's own attitudes and beliefs shape one's beliefs about others. Nonetheless, uncertainty derived from the same sources may generate the positive correlation we observe. It is also likely that beliefs about others, at least in part, feed back to shape one's own beliefs and attitudes. For example, perceptions about others could provide signals that generate conformity (e.g., by informing about the prevailing social norm) and induce social learning (e.g., about the underlying state of the world). Identifying the direction of causality underlying the relationships we document here is an interesting and important direction for future research.

## 4. PATTERNS OF RECALIBRATING MISPERCEPTIONS ABOUT OTHERS

An important question that the literature focuses on is whether experimental treatments can affect misperceptions about others as well as the consequences of recalibrated perceptions about others. Zooming in on the experimental components, we document some key stylized facts on recalibrating misperceptions about others.

The typical design used to recalibrate misperceptions about others in the existing literature is to provide respondents with (truthful) information about others.<sup>9</sup> Examining whether information provision can meaningfully affect perceptions about others allows one to understand (*a*) the extent to which biased or insufficient information is a crucial source of misperceptions about others and, more generally, (*b*) the degree to which the perceptions about others are elastic.<sup>10</sup>

In regard to the experimental structure, the existing studies generally feature two types of design. The first type of design elicits beliefs both prior to and after the experimental treatment among the treated subjects. Some studies re-elicite beliefs among the control group subjects as well (sometimes after a placebo treatment), whereas others skip this step and rely on the assumption that control subjects' beliefs do not change during the relevant time frame. This type of experimental design allows one to conduct within-subject analyses of the treatment effects, which could substantially increase statistical power. More importantly, such design allows for the same information treatment to have heterogeneous effects depending on the subjects' prior beliefs (and the positions of such prior beliefs relative to the information provided). A second type of experimental design elicits just one round of beliefs. For the treated subjects, belief elicitation occurs after the experimental treatments and hence measures posterior beliefs. This design requires the analysis to be conducted across subjects. Although they are typically more power demanding and less flexible in incorporating treatment effect heterogeneity, cross-subject designs may reduce concerns about anchoring thanks to the multiple rounds of belief elicitation, and it may also alleviate, at least in part, concerns over experimenters' demand effect.

### 4.1. Treatment to Recalibrate Misperceptions Generally Works

Can experimental treatments effectively change respondents' perceptions about others? To measure changes in beliefs due to the experimental treatments across papers, we use a metric that measures relative belief changes. We standardize the beliefs to the same scale (0–100), then we calculate the differences between posterior beliefs and prior beliefs, relative to the level of prior beliefs. We carry out this calculation within subjects when experimental design allows for such

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<sup>9</sup>Haaland et al. (2020) provide a review of the methodology of information treatments in general.

<sup>10</sup>Several studies introduce experimental treatments that may affect perceptions of others without directly providing information about them. A notable example is offered by treatments that aim to change social norms (e.g., Allcott 2011). These studies are not included in the meta-analysis here unless they explicitly elicit perceptions about others.

analysis and across subjects, between treatment and control group, if otherwise. We reorder the directions in which changes in beliefs take place, so that positive changes can be interpreted as successful belief movements toward the intended directions. For example, if in a study where respondents' beliefs about others generally overestimate the truth, and a treatment is assigned to move respondents closer to the truth, thus moving posterior beliefs downward, we flip the sign of belief changes: A relative change of 0.5 in this case would indicate that posterior beliefs have shifted downward by 50% relative to the level of prior beliefs.

When the studies in addition measure the exact truth of the phenomenon to which the perceptions refer, we develop a second measure of treatment effects based on belief convergence toward the truth. As with the first measure, we carry out this calculation within subjects when possible and across subjects otherwise. In order to homogenize such measure across papers, we again turn this into a relative measure, and positive numbers always indicate belief movements toward the truth. For example, a 50% convergence to the truth indicates that the treatment induces the treated subjects to update their perceptions about others (relative to their priors, when relevant) half-way toward the truth.

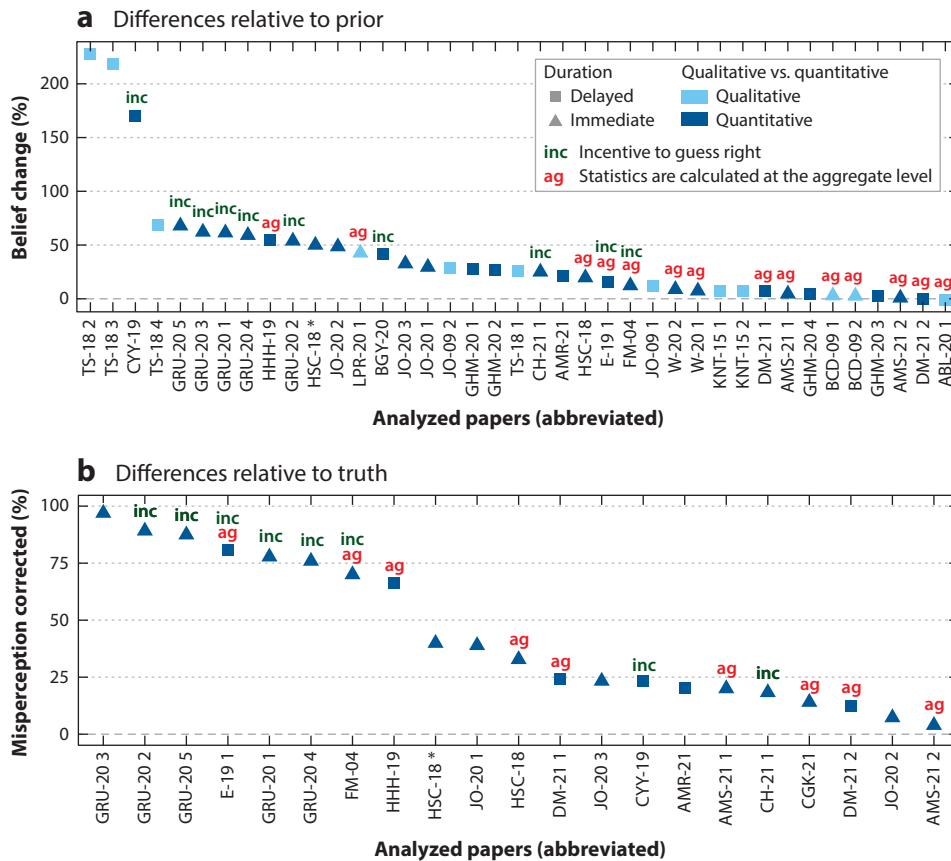
**Figure 6a** plots the experimental treatment effects on perceptions relative to the perceptions held prior to the treatment, and **Figure 6b** plots the treatment effects on perceptions relative to the truth in the corresponding dimensions (see **Supplemental Figure A.9** for treatment effects on both primary and secondary beliefs elicited in the studies). One observes that for all papers except for one, experimental treatments generate changes in respondents' perceptions about others along the intended direction.<sup>11</sup> This suggests that lack of accurate information could indeed be an important source of misperceptions about others. Moreover, information treatment in general does not backfire in affecting beliefs about others. This stands in contrast with the small but emerging literature that documents cases of backfiring in response to explicit attempts to shape individuals' beliefs and attitudes (e.g., Fouka 2020).

The magnitude of the changes in perceptions induced by the experimental treatments varies across papers. For example, providing respondents with information about others' characteristics changes beliefs about their political views by 25% (Carlson & Hill 2021); providing information about the proportion of immigrants living in a country changed respondents' beliefs by 54% (Grigorieff et al. 2020). In nearly a quarter of the studies, perceptions about others shifted by more than 50% relative to the levels of prior beliefs, and around half of the studies find changes in perceptions by at least 25%. Although full convergence to the truth is uncommon, in about 40% of the studies, experimental treatments move treated subjects' posterior beliefs at least halfway toward the truth, which corresponds to a substantial recalibration of perceptions about others. In all studies, treatments shifted beliefs toward the truth but never generated overcorrection of beliefs—which takes place when perceptions about others move too much and result in misperceptions in the opposite direction.

It is important to note that levels of aggregation make a significant difference in the identified effect sizes. Studies that exhibit moderate (or even minimal) changes in perceptions are almost entirely concentrated among those that carry out only across-subject comparisons. Depending on the distribution of prior beliefs relative to the treatment provided, the aggregate changes in perceptions could appear small if the number of subjects whose beliefs move upward and the number

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<sup>11</sup> Ashraf et al.'s (2020) study is the only one in which treatment generates changes in perceptions in the opposite direction. This study analyzed how interpersonal skills facilitate intergenerational investment and elicited parents' beliefs about their daughters' abilities. Among the several beliefs they elicited, the authors found that parents' assessment of girls' abilities relative to other classmates decreased after a negotiation training program.



**Figure 6**

The figure displays the experimental treatment effects on perceptions about others. Panel *a* shows belief changes relative to prior beliefs. Positive changes indicate that beliefs move in directions matching with the treatment intentions. Panel *b* shows the belief changes relative to true beliefs. Duration is immediate if the prior and posterior beliefs are elicited in the same round of survey and delayed if the prior and posterior beliefs are elicited in separate surveys with time lags. A treatment is qualitative if it is in the form of narrative or training and quantitative if it provides respondents with statistics or access to statistics. The label “inc” indicates belief elicitation that are incentivized, and the label “ag” indicates belief changes calculated at the aggregate level (across subjects). The asterisk indicates the effects of a cross-randomized treatment arm on the same outcome that allows for within-person analysis. The key applies to both panels. The papers are indicated by abbreviations; please refer to **Supplemental Tables A.1 and A.2** for the full references.

**Supplemental Material** >

of those whose beliefs move downward are comparable in size; this could be the case even when beliefs have changed substantially within subjects.<sup>12</sup> As shown in **Supplemental Figure A.10**, calculating belief changes in the aggregate considerably decreases the treatment effect sizes among the studies that have shown large effects within subjects. For the studies that do not elicit prior beliefs, we are unable to distinguish whether the moderate sizes are a result of the level of belief aggression or of the fact that misperceptions in the domains studied are indeed relatively inelastic to information provision. Future studies could help resolve such ambiguity by converging on

<sup>12</sup>Coffman et al. (2015) demonstrate this point explicitly in a model of information nudges.

experimental designs that elicit priors and thus allow for both within-subject and across-subject comparisons.

## 4.2. Qualitative/Narrative Treatment Tends to Have Larger Effects

We next examine whether the magnitude of the treatment effects on perception recalibration depends on the nature of the treatment content.

The experimental treatments in the existing literature typically fall under two broad categories in terms of content. In the vast majority of the studies, the treated subjects are provided with direct information about others. The information may be statistical, revealing the true summary statistics on the characteristics and opinions of others. For example, Jørgensen & Osmundsen (2022) provide Danish citizens with correct information about non-Western immigrants' crime rates and welfare dependency rates in order to change their beliefs about this group.

A small number of studies (six in total) feature treatments that are qualitative and narrative in nature. Rather than presenting quantitative information, these treatments aim to influence respondents' perceptions about others using narratives, anecdotes, vignettes, or immersive experiences such as pairwise matching, games, and specific training. Beaman et al. (2009) study how the exposure to female village council leaders influences people's perceptions about women's leader effectiveness and occupation stereotypes. López-Pérez & Ramirez-Zamudio (2020) present an anecdote about the firm of a famous Peruvian Olympic medalist that pays its taxes punctually to elicit people's beliefs about the average donations by others. Jensen & Oster (2009) estimate the effects of the introduction of cable TV on women's beliefs about their domestic and social status. Ashraf et al. (2020) study how the provision of negotiation training for girls affects parents' beliefs about their daughters' abilities and behaviors. Kendall et al. (2015) inform people of the competence and stance of the city managers via their political slogans. Finally, Turetsky & Sanderson (2018) involve students in stress management programs to convince them that mental health problems on campus are more prevalent than they believe.

We distinguish studies using qualitative versus quantitative treatment contents in **Figure 6**, where darker (lighter) symbols indicate the effects of studies using quantitative (qualitative) treatments. One observes that studies using qualitative treatment contents tend to generate larger effects on respondents' beliefs about others: In particular, three out of the five largest treatment effects documented across studies are generated by qualitative treatments. Moreover, the relatively large effects generated by the qualitative treatments are particularly pronounced if the belief elicitation is delayed rather than immediately following the experimental treatment (indicated by squares and triangles, respectively, in **Figure 6**). This suggests a possible interaction between endogenous memory of information (e.g., Zimmermann 2020) and the nature of the content regarding others.

The patterns described above are inconclusive, due to the small number of observations and, importantly, the lack of cross-randomization on experimental design features: There are differences among studies in many other aspects beyond those between qualitative and quantitative content. Hence, there is ample scope for future research to incorporate qualitative treatments into the experimental design. Studies that precisely identify the differences between quantitative and qualitative content in shifting beliefs will contribute to the recent interest in narratives among economists (e.g., Benabou et al. 2020, Shiller 2020).

## 4.3. Recalibrating Misperceptions Affects Behaviors, Particularly if Immediately After the Intervention

Having examined the experimental treatments' effects on recalibrating perceptions about others, we now investigate the treatment effects on respondents' behaviors.

We focus on behaviors that are directly associated with the perceptions about others that the treatments are intended to influence; often these behaviors are the primary focus of the study.<sup>13</sup> For example, in Bursztyn et al.'s (2020c) study, the primary behavior of interest is the husbands' willingness to sign up their wives for a job-seeking service in response to potential changes in beliefs about social norms regarding women working outside the home; and in Cantoni et al.'s (2019) study, the primary behavior of interest is citizens' participation in antiauthoritarian protest in response to potential changes in beliefs about others' participation. Whereas many papers examine changes in actual behaviors, either directly observed or self-reported, some papers focus instead on intended behaviors, often elicited immediately after the experimental treatments.

The notion of persuasion rate, first developed by DellaVigna & Kaplan (2007), provides a standardized measure to compare treatment effects' magnitudes across papers. Specifically, for each paper involving an experimental treatment aimed at changing behaviors, we calculate the following metric:

$$f = 100 \times \frac{y_T - y_C}{e_T - e_C} \frac{1}{1 - y_0},$$

where  $y_T - y_C$  is the difference in behavior between treatment and control groups,  $y_0$  is the behavior at the status quo (which is captured by  $y_C$  in studies that do not measure behaviors prior to treatment), and  $e_T - e_C$  is the difference in the shares of subjects exposed to the treatment between treatment and control groups. Intuitively, this measure captures the changes in behaviors (standardized into binary terms) among those who are exposed to the treatments that recalibrate perceptions about others. The magnitude of the behavioral changes is adjusted based on the proportion of respondents who have not yet adopted the behavior in the status quo (either in the control group or prior to the treatment interventions), capturing the upper bound of the changes in behaviors that can be expected to happen.

**Figure 7** presents persuasion rates related to the primary behaviors elicited across the examined studies (see **Supplemental Figure A.11** for persuasion rates related to the secondary behaviors when multiple behaviors of interest are measured). The persuasion rates associated with recalibrated perceptions about others range from 0% to 50%. Similar to the patterns observed in Section 4.1, all studies examined here exhibit positive persuasion rates, indicating that there is little evidence of behavioral backlash on average. About a third of the studies find persuasion rates above 10%; benchmarked against other studies that examine the effects of persuasion on political and economic behaviors, such magnitude is large (see DellaVigna & Gentzkow 2010 for a review of the empirical persuasion literature).

We next distinguish whether the behavioral outcomes are elicited immediately after the treatment inventions (i.e., in the same survey or experimental module; marked with triangles in **Figure 7**) or with a time lag (i.e., in different modules that take place after the interventions; marked with squares). One observes that the vast majority of the studies that document persuasion rates above 10% focus on behavioral outcomes measured immediately after the intervention, and many studies examining lagged behavioral outcomes yield persuasion rates that are moderate

Supplemental Material >

<sup>13</sup>In fact, a number of papers included in this part of the analysis do not elicit posterior beliefs about others but only elicit the corresponding behaviors. For example, Flory et al. (2015) observe job seekers' application decisions in response to different gender beliefs; and Ferraro & Price (2013) examine residents' water use habits when receiving technical advice and a message that appeals to prosocial preferences in the community.

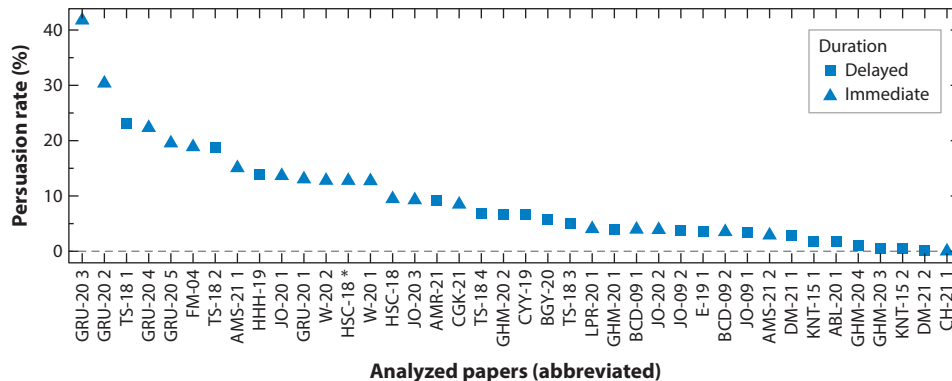


Figure 7

The figure displays the persuasion rates of different treatments. Duration is immediate if the prior and posterior beliefs are elicited in the same round of survey and delayed if the prior and posterior beliefs are elicited in separate surveys. The asterisk indicates the treatment effects of a cross-randomized treatment arm on the same outcome. The papers are indicated by abbreviations; please refer to **Supplemental Tables A.1 and A.2** for the full references.

or even close to zero.<sup>14</sup> For example, Grigorieff et al. (2020) elicit beliefs about the share of undocumented immigrants immediately after the information treatment and find a persuasion rate of 23%, whereas Kendall et al. (2015) elicit beliefs about politicians' ideology after more than a week and find a persuasion rate of only 0.4%.

There are several potential interpretations for this pattern. First, the studies differ in many respects beyond the immediacy of behavioral outcomes, and very few studies examine changes in behaviors in both the short and the long run after treatment inventions. For example, behavioral outcomes studied with a time lag are more likely to be in the domain of politics (see **Supplemental Figure A.13**). Second, even if both short- and long-run behavioral changes are elicited within the same study context, it can be challenging to distinguish whether behaviors are indeed difficult to change, especially in the long run, or the changes in perceptions induced by the treatment have eroded over time (e.g., Gerber et al. 2020). Perceptions about others might shift significantly between the time the treatments take place and the moment the behaviors occur, due to reasons such as regression to the mean, biased recall, or motivated memory (e.g., Bordalo et al. 2020). Examining the timing and evolution of updating beliefs about others in response to information shocks, and tracking the dynamics of behavioral changes and belief changes throughout the relevant time frame, can be an important direction for future research.

If we take at face value the moderate-to-minimum behavioral changes observed some time after the treatment (as discussed in Section 4.1), such magnitude stands in contrast with the relatively large treatment effects observed on the perceptions about others. This would suggest a rigidity in the mapping between (stated) perceptions of others and relevant behaviors. One possibility is that even though stated beliefs may have changed, the deeper underlying drivers of behavior may have not. For example, consider someone who is opposed to an out-group (e.g., immigrants). Originally, that person may have incorrectly believed that immigrants commit crimes at a very high rate. Correcting this misperception might affect this particular belief. However, the person

<sup>14</sup>**Supplemental Figure A.12** also differentiates the persuasion rates based on whether the studies feature a within-subject or across-subject treatment design and whether the treatments are qualitative or quantitative in nature.

may decide to rely on a different set of incorrect beliefs (e.g., immigrants steal jobs) to maintain their negative views on and behaviors toward immigrants. Understanding the ultimate source of misperceptions (such as motivated beliefs) and the extent to which misperception correction may spill over to other beliefs is an important avenue for future research that can help understand the potential for informational interventions to affect behaviors beyond the short run.

## 5. CONCLUSION AND LOOKING AHEAD

In recent years, a growing number of papers have examined the causes and consequences of misperceptions about others in the field. In this review, we have surveyed this literature and documented six stylized facts concerning the patterns of misperceptions about others and the recalibration of such misperceptions using experimental treatments.

Many open questions remain. We have highlighted a number of fruitful avenues for future research throughout the review. We now discuss several additional directions for future research that we believe would significantly advance our understanding of misperceptions about others.

First, more work is needed to explicitly identify the sources of misperception. The majority of studies investigate beliefs about others in laboratory environments, and it would be a promising effort to map these beliefs into field context. Extending the analysis to a broader range of domains would also inform us about whether misperceptions are omnipresent or there are areas in which perceptions about others are well calibrated. This could shed light on the reasons for which misperceptions emerge. Moreover, theoretically grounded investigations of the sources of misperceptions—particularly studies that incorporate designs that explicitly rule in and out existing theories—would have great value. The patterns that we document may also generate additional theoretical frameworks to understand the origin of misperceptions; for example, models that generate asymmetry in misperceptions or that explicitly incorporate supply-side factors could help account for a number of regularities of beliefs documented in the literature.

Second, more work is needed to understand the different ways in which misperceptions can be recalibrated and under what conditions such recalibrated misperceptions may actually lead to behavioral changes. Investigations of the sources of misperception that are more grounded in theory could inform us about the elasticities of such misperceptions with respect to treatments of various nature. Systematically comparing different treatment designs (e.g., quantitative versus narrative content) to correct misperceptions would greatly enhance our understanding of misperceptions in general. Moreover, to the extent that belief updating in itself cannot recalibrate the deeper underlying factors that drive misperceptions in the first place, treatments of a very different nature may be needed to induce behavioral changes. For example, would opportunities to guide reasoning and improve empathy be a more powerful tool to recalibrate misperceptions about others?

We also note that much of the existing work does not explore the dynamics and the evolution of both belief changes and behavioral responses. This would be an important avenue for future research, because mechanisms such as selective memory and attribution errors may interact with the largely cross-sectional patterns of misperceptions that the literature has documented thus far. For example, is the quantitative information provided to respondents more easily forgotten than qualitative narratives? Is memory about perceptions about others motivated (e.g., like the beliefs about oneself documented by Zimmermann 2020)? Do people seek biased information along their original priors, after the experimental treatment has recalibrated their beliefs?

Third, an important direction for future research is to consider the welfare implications of widespread misperceptions and their correction. One such normative consideration—which is out of the scope of the existing literature—is to examine whether informing people about the true state of the world to recalibrate their perceptions is always desirable. To the extent that

authoritarian regimes may manage to sustain political control by manipulating citizens' perceptions of each other (see, e.g., Kuran 1997), would policies that induce certain perceptions about others be able to expand political rights and freedom to more people in the world? To the extent that misperception might be self-fulfilling, can policy be designed to engineer misperceptions that lead to more socially desirable outcomes (e.g., in the contexts of racial tolerance and gender equality)?

We look forward to the exciting future research that will extend this literature and answer some of these open questions.

## DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

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