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Misperceptions and Fake News During the COVID-19 Pandemic

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Abstract

By conducting large-scale surveys in four European countries, we investigate the determinants of right- and left-wing misperceptions as well as fake news exposure and sharing. We also shed light on how the COVID-19 pandemic influenced both misperceptions and fake news. Our results indicate that people substantially overestimate the share of immigrants, Muslims, people under the poverty line, and the income share of the richest. Female, lower-income, and lower-educated respondents have higher misperceptions, whereas the higher-educated, male, married, right-wing and, younger respondents share fake news more often, both intentionally and unintentionally. The COVID-19 pandemic increased fake news sharing and amplified right-wing misperceptions.

Keywords: COVID-19, Lockdown, Misperceptions, Fake News

1 Introduction

Misperceptions impede our ability to form meaningful policy stances and may undermine democratic institutions. The public debate on whether and how vaccines should be administered, or how to shape environmental and immigration policies are examples of controversial issues that may be substantially affected by people's misperceptions (Alesina, Miano, and Stantcheva 2018; Flynn, Nyhan, and Reifler 2017; Nyhan 2020). Misperceptions also determine electoral outcomes, and therefore shape policy making for years to follow. In the United States, it were non-hispanic white voters who secured the 2016 election win for Donald Trump. Despite being two-thirds of eligible voters and three quarters of the actual voters (Igielnik and Buddiman 2020), their misperception that they were becoming a minority may have influenced their voting decisions (Cohn 2016). In a similar fashion, immigration has become the top concern in Europe where an increase in immigration rates has led to larger ethnic diversity (Turton and Gonzalez 2000). Alesina, Miano, and Stantcheva (2018) show that European voters have large misperceptions regarding immigration. Moreover, Boerzel and Risse (2018) contend that recently the support for anti-immigration policies has increased and political parties who support border-closures and a 'fortress Europe' have gained momentum.

Just as for immigration, Gimpelson and Treisman (2015) report that widespread ignorance and misperceptions exist regarding income distribution. It was argued even in the popular press that those aforementioned misperceptions may have important economic and political consequences (Badger 2015). Therefore, understanding the drivers of misperceptions regarding immigration, religion, or income distribution is imperative for academics and policymakers alike.

In this context, fake news is particularly pernicious as it spreads misleading and false information (Lazer et al. 2018).[1] Lockdowns and mobility restrictions imposed during the pandemic led to an unprecedented flow of false information (Ceron, de-Lima-Santos, and Quiles 2021). Recent studies also show that the information overload during the COVID-19

[1]Lazer et al. (2018) distinguish between misinformation (false or misleading information) and disinformation (false information that is purposely spread to deceive people). In both information contexts, fake news may promote misperceptions.

pandemic increased the likelihood of fake news sharing by increasing consumers' psychological strain (Bermes 2021; Apuke and Omar 2021). Thus, the pandemic may have contributed to elevated misperceptions through a channel of increased fake-news sharing. Boomgardeb and Vliengenhardt (2009) show that both the frequency and the tone of coverage of immigrant actors in the news have a significant effect on immigration attitudes. Schlueter and Davidov (2013) show that an increased number of negative immigration-related news reports increases perceived group threat over and above the influence of immigrant group size, and the impact of negative immigration-related news reports on perceived group threat is amplified in regions with a smaller immigrant group size. Through changing "attitudes", news coverage of immigrants also affects electoral results: the more news media reported about immigration-related topics, the higher the aggregate share of vote intention for anti-immigrant parties (Boomgaarden and Vliegenthart 2007).

In this paper, we scrutinize the socio-economic determinants of a variety of misperceptions as well as fake news exposure and sharing, and investigate whether the elevated fake news during the Covid-19 pandemic had an impact on the magnitude of these misperceptions. Therefore, we aim to answer four research questions: (1) Which individual socioeconomic characteristics determine misperceptions (2) Which individual socioeconomic characteristics determine fake news sharing (3) Have the COVID-19 pandemic and subsequent lockdowns influenced misperceptions and fake news? (4) Is the exposure to and sharing of fake news the culprit for increased misperceptions? For this purpose, we conducted a large-scale survey between March 3 and March 30, 2020 in France, Germany, Spain, and the United Kingdom totalling around 16,000 respondents. During this period, the COVID-19 pandemic started spreading rapidly, the World Health Organization (WHO) declared a public health emergency of international concern, and nationwide lockdowns were implemented in all four countries.

We examine misperceptions on four key topics that are usually exploited by populist parties: immigration, Muslim population, poverty, and income distribution. Following Rodrik (2018), we distinguish between left-wing and right-wing variants of populism: whereas right populist politicians mainly emphasize a cultural division (i.e., the national, ethnic, religious, or cultural identity of the "people" against outside groups), left-wing populists place the emphasis on

the economic division (i.e., wealthy groups who control the economy versus lower income groups without access to power). Therefore, misperceptions regarding immigration and Muslim population are generally associated with right-wing populism, whereas those regarding poverty and income distribution are associated with left-wing populism. We quantified misperceptions by asking respondents to guess the share of immigrants, Muslims, people below the poverty line, and the income share of the richest 10 %. We subsequently compared the respondents' guesses with the official statistics in each country to quantify the magnitude of misperceptions (Alesina, Miano, and Stantcheva 2018). Concerning fake news, based on a public opinion poll previously conducted by Barthel, Mitchell, and Holcomb (2016) for the Pew Research Center, we investigated how often respondents came across fake news as well as whether respondents shared fake news and whether they did it intentionally or not.

Previous literature provides a number of socioeconomic determinants for both misperceptions and, to a lesser extent, fake news sharing (Buchanan 2020; Alesina, Miano, and Stantcheva 2018). We contribute to this literature by investigating how the COVID-19 pandemic, as well as the lockdowns that followed, affected the magnitude of both right- and left-wing misperceptions and the salience of fake news. The unique circumstances surrounding our survey period allowed us to observe how a global level shock that increased transactional stress relates to the flow of misinformation and subsequent misperceptions.

Our results indicate that people tend to substantially overestimate the share of immigrants, Muslims, those who live under the poverty line, and the income share of the richest. Even after controlling for political orientation, other socioeconomic variables, such as gender, education, income, and labor market status, are found to be significant determinants of both right-wing (immigration and Muslim population) and left-wing (poverty and income distribution) misperceptions. More specifically, female, lower-income, and lower-educated population have higher misperceptions in general. Our results document that the global pandemic and the lockdowns were followed by amplified Muslim misperceptions, while leaving other misperceptions unchanged. We also contend that the pandemic has a disproportionate effect on women's misperceptions: their Muslim and poverty misperceptions increased more than that of males during the pandemic. A potential mechanism is that women are perceived to be easier to mislead

than men (Kray, Kennedy, and Van Zant 2014), and therefore may be more targeted with fake news.

Consistent with our a priori expectations, we also show that inadvertent fake news sharing has increased during the pandemic. Here, it is particularly the male, higher-educated, married, right-wing and, younger population that share fake news (both voluntarily and unintentionally) more often. These results are consistent with the previous literature which suggests that men are more likely than women to tell lies for a small gain (Dreber and Johannesson 2008) and to consider themselves to be good at lying and at getting away with it (Verigin et al. 2019). Similarly, our results are in line with Piff et al. (2012) who showed that the upper classes were more likely to engage in unethical behaviour and Guess, Nagler, and J. Tucker (2019b) who showed that older (and in our case, possibly married) people are more likely to share fake news.

2 Background

2.1 Right-wing Misperceptions

Belief biases are at the core of our understanding of discrimination, as discrimination is usually based on erroneous beliefs (Benjamin 2019). While a number of previous studies document that immigration increases support for far-right candidates in elections and often decreases support for redistribution, others point out that it could be misperceptions regarding immigration rather than the immigration itself that affect policy preferences.

Alesina, Miano, and Stantcheva (2018) show that when it comes to immigration, salience and narratives shape people's views more deeply than hard facts. Their large-scale surveys and experiments in France, Germany, Italy, Sweden, the United Kingdom, and the United States provide evidence for substantial misperceptions about the number and characteristics of immigrants in all six countries. More specifically, respondents overestimated the number of immigrants and their unemployment rate. By contrast, respondents underestimated immigrants' education levels. Alesina, Miano, and Stantcheva (2018) also found that misperceptions were more prevalent among older, female, low-educated, and low-income respondents. Herda (2010), Sides and Citrin (2007) and Semyonov, Raijman, and Gorodzeisky (2008) reported similar

findings for a broad set of European countries. These strong misperceptions persisted even when respondents were offered monetary incentives to answer correctly. Herda (2019) demonstrates that a comparable bias regarding the share of immigrants exists in the United States, that this bias has increased over time, and that this increase is most pronounced among politically conservative Americans. In a similar vein, Nadeau, Niemi, and Levine (1993) found that Americans greatly overestimate the share of minorities such as blacks, Hispanics, and Jews. For instance, while the share of the Jewish population in the United States is only 2-3 %, almost 40 % of respondents estimated the population share at 20 % or more. In a more recent study, Alba, Rumbaut, and Marotz (2005) found that roughly half of Americans believe that whites have become a numerical minority.

2.2 Left-wing Misperceptions

Systematic biases also exist in people's perception of inequalities. The literature on distributive perception biases can roughly be divided into two strands: the self-positioning approach and the stratification approach. In the self-positioning approach, people are asked to assess their own position in the income distribution of their country. This is done by asking a question such as "There are ... million households in [your country]. Of those ... million, how many do you think have an income lower than yours?" Using the self-positioning approach, Cruces, Perez-Truglia, and Tetaz (2013), Karadja, Mollerstrom, and Seim (2017), and Engelhardt and Wagener (2018) found that low-income earners tend to overestimate, whereas high-income earners tend to underestimate their rank in the income distribution. Evans and Kelley (2004) had already demonstrated this phenomenon back in 2004 and attributed it to people's tendency "to see oneself as being in the middle of a hierarchy".[2] Overall, this leads to a bias toward the median. Hence, the self-positioning approach suggests that people *under*estimate true income inequality.

The stratification approach follows a different strategy. Respondents are presented with a number of different income distributions in a diagrammatic representation (a pyramid, an urn..) and asked to choose which of the alternatives best describes the income distribution of their own

[2]For a deeper investigation into this argument, see Knell and Stix (2020).

country. Niehues (2014) found that respondents chose the correct distributions only slightly more often than what could be expected under random choice. Alternatively, respondents are asked to guess the correct value on a simple statistical measure of income inequality such as the income share of the top earners. This approach is analogous to the approach used for right-wing misperceptions. Gimpelson and Treisman (2018) found that respondents' guesses were often far off the true values. Whether there is over- or underestimation of income inequality using the stratification approach depends on the country under consideration and the inequality proxy chosen in the respective studies. For the United States, Osberg and Smeeding (2006) proxied inequality by the earnings ratio between production workers and Chief Executive Officers (CEOs). They found that inequality is underestimated. A similar finding was obtained by Kiatpongsan and Norton (2014) and Page and Goldstein (2016). By contrast, Engelhardt and Wagener (2018) found that respondents tended to overestimate inequality in Germany. When we compare the corresponding data for the four countries under consideration in our paper (France, Germany, Spain, and the United Kingdom) from Niehues (2014) and Gimpelson and Treisman (2018), the respondents in these countries shared the tendency to overestimate income inequality. The stratification approach has also been applied to study poverty misperceptions. In a study on perceived and actual poverty in Israel, Malul (2019) found a severe overestimation. On average, respondents estimated the share of people whose income falls below the poverty line at 30.7 % while the actual share was 18.5 %.[3]

Arsenio and Willems (2017), who carried out face-to-face interviews with mostly lower-middle–income Latino and African American adolescents, found that adolescents underestimated actual levels of U.S. wealth inequality while also preferring a more egalitarian distribution than was believed to exist. Using Australian data, Norton et al. (2014) show that the underestimation of wealth inequality is not due to an American exceptionalism.

[3]For a survey to what extent correcting misperception influences beliefs and behavious, see Hauser and Norton 2017.

2.3 Fake news

The spread of fake news is becoming a public and global concern (Lazer et al. 2018). For instance, Allcott and Gentzkow (2017) suggest that in the 2016 US presidential election, fake news had a considerable impact and could even have been crucial in determining the outcome of the election. However, not all individuals who encounter fake news are also willing to spread it. Grinberg et al. (2019) examined exposure to and sharing of fake news in the US 2016 election and found that engagement with fake news sources was highly concentrated among certain subpopulations. Individuals most likely to engage with fake news sources were conservative-leaning, older, and those highly engaged with political news. Similarly, Guess, Nagler, and J. Tucker (2019a) found that conservative people and those older than 65 were more likely to share pro-Trump fake news. By contrast, Buchanan (2020) found that younger, male, and less educated individuals are more likely to further spread disinformation material that they encounter on social media.

In a survey of the literature on the relationships between social media, political polarization, and political disinformation, J. A. Tucker et al. (2018) list a number of potential actors that are involved in the production and dissemination of misinformation and, therefore, mislead people about a wide range of relevant political issues. These actors include trolls, bots, fake news websites, conspiracy theorists, politicians, highly partisan media outlets, the mainstream media, and foreign governments. In this vein, Flynn, Nyhan, and Reifler (2017) argue that political elites and the media in particular seem to play a critical role in creating, spreading, and exploiting misperceptions. They contend that disseminating fake and unsupported information is crucial to understanding the nature and origins of misperceptions. In an experimental survey during the 2017 French presidential election campaign, Barrera et al. (2020) found that alternative facts were highly persuasive irrespective of fact checking, which may explain why politicians use alternative facts despite facing the risk of being fact checked.

People most exposed to fake news also appear to be most vulnerable to misperceptions. According to Barthel, Mitchell, and Holcomb (2016), about two-in-three US adults state that fake news causes a great deal of confusion about contemporary issues and events. This sense of confusion is shared widely across incomes, education levels, partisan affiliations and most

other demographic characteristics. Despite this great confusion, most people appear to be confident in their own ability to spot fake news (Scheufele and Krause 2019). However, Allcott and Gentzkow (2017) found that partisan individuals may have more difficulty identifying fake news that confirms their political stances. After the 2016 US presidential election, partisan individuals were much more likely to believe headlines that favored their preferred candidate, and this ideologically aligned inference was substantially stronger for those with ideologically segregated social media networks. Basol, J. Roozenbeek, and S. van der Linden (2020) show that learning about common misinformation techniques significantly improves people's ability to spot fake news.

3 Theory and Hypotheses

To curb the infection rate of the coronavirus, most countries implemented drastic measures such as lockdowns and some countries even implemented curfews. Businesses deemed as "non-essential" were closed and employees in these businesses were either laid off or furloughed. Many businesses went bankrupt. Although no previous studies have investigated how misperceptions evolved during the COVID-19 pandemic, several potential mechanisms suggest that right-wing misperceptions are likely to have increased. Drawing from discrimination theory, previous studies indicate that economic conditions are a major source of discrimination toward outside groups and minority populations. Analyzing 12 European countries, Semyonov, Raijman, and Gorodzeisky (2006) found that anti-foreigner sentiment is more pronounced in places with worse economic conditions. Similar findings were obtained by Kunovich (2004). Moreover, this relationship between economic conditions and anti-foreigner sentiment remains unchanged over time (Semyonov, Raijman, and Gorodzeisky 2006). The socio-psychological theory of discrimination provides an explanation for these findings. Worsened economic conditions are often associated with more intensive labour market competition, and outside groups and minorities are often either blamed for the economic decline (scapegoats) or for unfair economic competition (scabs) (Semyonov, Raijman, and Gorodzeisky 2008; Semyonov, Raijman, and Yom-Tov 2014). Given the worsened economic conditions, anti-foreigner sentiment may have grown (Semyonov, Raijman, and Gorodzeisky 2006). The sense of increased competition from

an outgroup could magnify the perceived size of this group (*group threat theory*). As a result, we hypothesize that right-wing misperceptions regarding the share of immigrants and the Muslim population increased after countries implemented lockdowns.

A similar line of argument can be drawn for the impact of lockdowns on left-wing misperceptions. The lockdowns have triggered a big shock for many businesses, which were completely shut down or could no longer operate profitably. This economic shock has stirred a debate of whether the pandemic will lead to more inequality and foster the existing trend towards higher inequality. Chen, Gozgor, and Koo (2021) find that pandemics are positively associated with income inequality in 34 OECD economies. Perceptions of the change in inequality, however, may be different than the realized changes. Some service sectors such as the hotel and restaurant industry were severely affected by the shock. Workers who already earned low wages in these sectors were laid off or had to reduce working hours. Experiencing such setbacks in the neighborhood or hearing about them in the news may enlarge perceptions of inequality. Interestingly, Asaria, Costa-Font, and Cowell (2021) contend that individuals who have personally experienced either a health or a financial shock during the COVID-19 pandemic, exhibit lower inequality aversion in terms of health and income, compared to those who have not experienced these shocks. At the other end of the income spectrum, there was also a small elite benefiting from the shock (Inequality.org). The lockdowns limited the consumers opportunities (e.g., to shop at the most inexpensive location), created new scarcities and therefore increased profits in some businesses. So some top incomes may have skyrocketed. Reports about the winners of the pandemic, rapidly increasing consumer prices in retail and about the upward trends in stock markets – despite lockdowns – may have contributed to enhanced misperceptions of inequality.

A priori, we are agnostic of whether it was the shock of the lockdown – a measure unthinkable in western societies before 2020 – or the gradual slide into the pandemic, which triggered enhanced misperceptions. Therefore, we formulate two hypotheses – one regarding the shock of the lockdown, the other about the course of the pandemic.

Hypothesis 1: a) In the course of the pandemic, we observe an increase in misperceptions. b) After the lockdown, we observe an increase in misperceptions.

A potential mechanism through which the pandemic may have increased misperceptions

is fake news. During the COVID-19 pandemic, fake news has mainly been related to health issues (contagiousness, social distancing, mortality rates, drugs, masks, vaccinations, etc.), and a rampant partisanship has been an obstacle to limiting the spread of the virus (Clinton et al. 2021; Kushner Gadarian, Goodman, and Pepinsky 2020; Makridis and Rothwell 2020; Young and Bleakley 2020). The sharp increase of fake news during the pandemic has even been considered a "second pandemic" (Nature, 2020). Recently, some studies have implied a possible connection between fake news and misperceptions in the pandemic context. Bridgman et al. (2020) found that exposure to social media was associated with misperceptions regarding basic facts about COVID-19. These misperceptions were in turn associated with lower compliance with health measures.

How can the pandemic affect the frequency of fake news not just on health issues but also on other policy issues such as inequality or immigration? Recent studies show that threatening situations can induce people to commit more unethical acts (Kouchaki and Desai 2015; H. Zhang et al. 2020). When people experience anxiety, their mind shifts from cognitive processes towards intuitive and automated processes. As several lab experiments have shown, more acts that are considered as unethical in cognitive deliberations are committed under these automated processes. We argue that the Covid-19 pandemic constitutes such a threatening event. It creates anxiety, which is defined as "“a state of distress and/or physiological arousal in reaction to stimuli including novel situations and the potential for undesirable outcomes" (Brooks and Schweitzer 2011). Covid-19 clearly is such a novel situation, which is perceived as a vague, diffuse or potential threat. Under state anxiety, information processing is slowed down, thus giving room for automated unethical behavior such as the – at that moment willingly – sharing of fake news. Some recent studies conducted during the pandemic indeed find that psychological strain can increase the likelihood of fake news sharing (Bermes 2021; Apuke and Omar 2021). It might not only be the threatening situation of the pandemic itself but also the information overload in times of crises that trigger anxiety, which in turn makes people more susceptible to fake news sharing.

An alternative channel why the pandemic might have led to more fake news sharing in all domains is boredom. Pfattheicher et al. (2020) show that inducing boredom among participants

in an experiment increases sadistic behavior. This does not only hold regarding the direct impact on others (e.g., destroying other participants' payoffs) but also in indirect ways such as online trolling. In our survey, we cannot distinguish the two channels of anxiety and boredom. However, both channels suggest that fake news sharing increased during the pandemic. As we only have the subjective evaluation of our respondents, we cannot directly measure the exposure to fake news and the true – intentional or accidental – sharing of fake news. However, we have a measure for self-reported intentional sharing of fake news.

Hypothesis 2: a) In the course of the pandemic, we observe an increase in fake news. b) After the lockdown, we observe an increase in fake news.

There is also some recent evidence that under stress, men are more likely to share unchecked news and women are more willing to consume such news without verifying (cyberchondria) (Laato et al. 2020). Hence, the magnitude of the increase in fake news sharing should be larger for men. It was argued that conservatives were more likely to share articles from fake news domains, than liberals or moderates, and users over 65 shared nearly seven times as many articles from fake news domains as the youngest age group (Guess, Nagler, and J. Tucker 2019b). Finally, Piff et al. (2012), using experimental and naturalistic methods, argued that upper-class individuals behave more unethically than lower-class individuals. In our dataset, we proxy the social class with the level of education.

Hypothesis 3: After the lockdown, we observe an increase in the intentional sharing of fake news, and this increase is more pronounced for men, and for older educated netizens.

If the previously mentioned cyberchondria argument holds, we should find at least indirect evidence. The argument claims that information is less verified under stress and that this mechanism is stronger for women. Hence, we argue that more unchecked consumption of news in times of psychological strain translates into changes of perception biases.

Hypothesis 4: After the lockdown, we observe an increase in perception biases, and this increase is more pronounced for women.

4 Data

4.1 Data collection

We conducted large-scale surveys in four European countries: France, Germany, Spain, and the United Kingdom. The survey was designed and programmed by the authors via Qualtrics, and was administered between March 3 and March 30, 2020 in all four countries by the company Respondi (`https://www.respondi.com/EN/`), which has access to panels of representative samples of respondents to whom they send out survey links by email. The survey was administered to 31,568 respondents in the local language. The average time for completion of the survey was 24 minutes and the respondents were paid only if they fully completed the survey. We removed respondents who did not complete the demographic part of the questionnaire and who completed the survey either very fast (in less than 5 minutes) or very slow (more than two hours). Our final sample includes 18,581 respondents aged 18 to 70 who completed the whole questionnaire. The sample is close to representative in each country (see Table C.1 in Appendix C). The sample sizes are 5,056 for Germany; 4,529 for France; 4,475 for the United Kingdom; and 4,521 for Spain. Not all respondents filled out all the questions that we use as outcomes. Therefore, the sample sizes vary by outcome.

4.2 Variables construction

The survey has three components: (1) socioeconomic characteristics, (2) fake news, and (3) misperceptions. The complete English version of the survey is provided in Appendix A.

In the first set of questions, respondents were asked about socioeconomic characteristics. To enable comparisons with the previous literature, we followed Alesina, Miano, and Stantcheva (2018) and constructed the following socioeconomic characteristics: gender (1 is female, 0 is male), age (18-35 years old, 36-54 years old, and 55-70 years old), education (1 is high educated, 0 is low educated), marital status (1 is married or cohabiting, 0 is separated or single), household income (low income, middle income, high income), labour market position (employed, unemployed, out of the labor force), and political orientation (left, center, right).

To elicit the exposure to and sharing of fake news, we followed a public opinion poll

previously conducted by Barthel, Mitchell, and Holcomb (2016). In particular, participants were asked: i) Please indicate on a scale of 0-10 how often you come across news stories about politics online that you think are not fully accurate; ii) Have you ever shared a political news story online that you later found out was made up?; and iii) Have you ever shared a political news story online that you thought at the time was made up? Thus, fake news frequency is a scale variable ranging from 0-10, and we coded the sharing of fake news unwillingly and willingly as a binary indicator given a value of one if the respondent shared fake news and zero otherwise.

In the third set of questions, we explored misperceptions. For right-wing misperceptions, we elicited the respondents' perception on the number of immigrants and the number of people practising Islam. The particular questions (for the United Kingdom) are as follows: i) Think about all of the people currently living in the United Kingdom. Out of every 100 people in the United Kingdom, how many are born in another country?, and ii) Fill in the boxes below to indicate how many out of every 100 people in the United Kingdom you think practise Islam. For left-wing misperceptions, participants were asked about their perceptions on poverty and the share in income of the richest people. The questions are as follows: i) Out of every 100 adult people born in the United Kingdom, how many live below the poverty line?, and ii) What do you think is the income share of the richest 10 % of all people living in the United Kingdom? In the survey, we defined the poverty line as the estimated minimum level of income needed to secure the necessities of life.

We operationalized misperceptions as indices that subtract the actual statistics to the respondents' guesses. For instance, if the respondents guessed that there are 30 immigrants for every 100 people, whereas there are actually 5 immigrants for every 100 people in their country, the misperception index would amount to 25. Note that the misperception index can also be negative if people's guesses are below the actual numbers. If a person guesses 4 and the actual number is 5, the misperception index would amount to -1. Thus, we consider four misperception indices as outcomes: misperception on the share of immigrants, on the share of Muslim population, on the share of people below the poverty line, and on the income share of the richest 10 %.

The actual statistics were obtained from various sources as outlined in Appendix B. We gathered the most recent data available to the public in March 2020. The only data that was

available in this period applied to 2018 for most indices. It could be argued that people may actually have a better perception through their environment than the official statistics from two years ago. In this case, our estimates of misperceptions would be overestimated. However, this is unlikely to be the case as most of these indicators, such as the number of immigrants or the income share of the top 10% are unlikely to greatly fluctuate in such a short period.

We are also interested in how the COVID-19 pandemic relates to misperceptions and fake news. For this purpose, we constructed a binary indicator for each country given value of 1 after the lockdown and a value of 0 before the lockdown. We used the following dates of the first lockdown in each country to construct this variable: March 23, 2020 in Germany and the United Kingdom, March 17, 2020 in France, and March 15, 2020 in Spain. Depending on the specification, we also included a day-by-day trend variable representing the pandemic. Descriptive statistics of all the variables are presented in Table 1.

5 Methodology

We estimate how misperceptions and fake news relate to different demographic characteristics and the lockdown using a linear model estimated by Ordinary Least Squares (OLS):[4]

$$Y_i = \alpha + \beta L_i + \alpha \mathbf{D_i} + \epsilon_i \tag{1}$$

In Equation 1, Y_i represents the right- and left-wing misperception indices as well as the fake news variables for individual i. One variable of interest is L_i, given a value of 1 after the lockdown and a value of 0 before the lockdown. The parameter β represents the change in misperceptions and fake news after the lockdown. We also relate a vector of socioeconomic factors $\mathbf{D_i}$ to misperceptions and fake news. These include the country (France, Germany, Spain, and the United Kingdom), gender (1 is female, 0 is male), age (18-35 years old, 36-54 years old, and 55-70 years old), education (1 is high educated, 0 is low educated), marital status

[4]Note that outcome variables that deal with fake news sharing are binary. Nonetheless, we opted for a linear probability model instead of a logistic regression to enable comparisons with the previous literature and to streamline the interpretation of interactions (Gomila 2021).

(1 is married or cohabiting, 0 is separated or single), household income (low income, middle income, high income), labour market position (employed, unemployed, out of the labor force), and political orientation (left, center, right). In each specification, we use robust standard errors. The reader should keep in mind that we are not able to account for endogeneity arising from omitted factors or reverse causality and therefore do not make any causal claims. Nonetheless, we do provide timely evidence of how the COVID-19 pandemic is related to misperceptions and fake news.

6 Empirical results: Misperceptions

6.1 Right-wing misperceptions

Figure 1 and columns 1 and 2 of Table 2 show that people significantly overestimate both the share of immigrants and the Muslim population.[5] The actual share of immigrants ranges from 12 % in France to 17 % in Germany. The respondents expected this share to be around 25 to 30 %. Thus, the immigration misperception is about 12 percentage points on average in the four countries in our sample. The misperception is even larger when it comes to the share of population of Muslim faith. The respondents guessed that this share is about 20%, a substantial overestimation as the actual share is less than 5 % in all four countries. The overestimation of both figures is in line with the existing literature. Alesina, Miano, and Stantcheva (2018) also found that the share of immigrants was overestimated by around 20 percentage points (23% in the U.K., 22% in France, and 22% in Germany).[6]

Misperceptions go along with political orientation: left-leaning respondents had smaller and right-leaning respondents had higher misperceptions than centrists. But even those who placed themselves in the left of the political spectrum significantly overestimated the share of immigrants and Muslims. Compared to centrists, their misperceptions, are, on average, 3 to 4

[5]The table that includes the exact values used to construct Figure 1 is presented in Appendix C.

[6]There is a similar overestimation even in Canada, which perceives itself as a multicultural immigration country. In Canada, the individual perception bias does not go along with more negative views towards immigration (Herda 2020). For European countries, there are ambiguous findings whether perception bias and attitudes correlate (Gorodzeisky and Semyonov 2020; Hjerm 2007).

percentage points smaller.

Even after controlling for political orientation, socioeconomic factors have additional explanatory power for right-wing misperceptions. For instance, both immigration and religion misperceptions shrink with income and education. Moving from low to high education reduces misperceptions by 4 to 4.5 percentage points. Similarly, the unemployed have significantly higher misperceptions in both dimensions. We also find that women tend to exhibit a larger magnitude than men for both immigration and religion misperceptions. The overestimation of the immigrant share shrinks with age. This might be due to the larger exposition of younger cohorts to immigrants and respondents may use their own cohort as a reference group when estimating the share of immigrants in the entire population. The importance of the proximity (i.e. making predictions based on your own cohort) is consistent with Sigelman and Niemi (2001), who show that for the black minority in the US, misperceptions increase with the black population in the respondents' neighborhoods. Finally, there is no difference in terms of age in the misperceptions of the Muslim share.

Our findings regarding immigration are in line with the studies by Alesina, Miano, and Stantcheva (2018), Gorodzeisky and Semyonov (2020), Herda (2010) and Semyonov, Raijman, and Gorodzeisky (2008), who also identify low education, young age, and gender (women) as socioeconomic factors significantly driving higher misperceptions. The same socioeconomic characteristics proved to be significant for the overestimation bias in the studies of Nadeau, Niemi, and Levine (1993) and Alba, Rumbaut, and Marotz (2005) on perceptions of US minorities. There is one major difference to Alesina, Miano, and Stantcheva (2018) and Semyonov, Raijman, and Gorodzeisky (2008): We find that right-wing misperceptions increase when respondents move from left to right in the political spectrum. By contrast, left- and right-wing respondents did not exhibit statistically significant differences in their perception of the share of immigrants in previous studies. In Herda (2010), misperceptions were even smaller among politically conservative respondents.

6.2 Left-wing misperceptions

To capture misperceptions that are often associated with leftist views, we asked the survey participants to estimate the share of people living below the poverty line and the income share of the richest 10 % in their country of residence. These estimates were then contrasted with the most recent actual statistical figures. The results on misperceptions of poverty and income inequality can be found in Figure 2 and Table 2, Columns 3 and 4.

The respondents significantly overestimated both poverty and income inequality. The poverty rates in our four countries range from 10% in France to 18% in Spain. On average the poverty rates were overestimated by 11 percentage points. Likewise, the actual income share of the richest 10% is quite similar in all four countries, ranging between 24% and 26%. On average, the respondents overestimated those shares by 13 percentage points.

Notable cross-country differences emerge. In the UK, the misperceptions are larger in both dimensions compared to Germany, which is the reference group. In France, the misperceptions regarding the poorest are larger and the misperceptions regarding the richest are smaller than in Germany.

When we turn to the socioeconomic determinants of left-wing misperceptions, political orientation, once again, plays an important role for both the income distribution and for the poverty misperceptions. Centrists respondents have the highest poverty misperceptions, in comparison to both those who identify as right or left wing. By contrast, misperceptions regarding top incomes become larger the further left respondents place themselves on the political scale.

As in the case of right-wing misperceptions, we find that the other socioeconomic variables have strong explanatory power even when controlling for political orientation. In contrast to right-wing misperceptions, however, socioeconomic factors driving left-wing misperceptions are less uniform. For instance, women show a stronger overestimation of the share of those under poverty line; men exhibit stronger overestimation of the income share of the richest. A similarly split picture emerges regarding age: overestimation of poverty decreases with age (as it was the case with right-wing misperceptions), but inequality misperceptions grow with age. Highly educated and high-income respondents exhibit significantly smaller poverty misperceptions but

significantly larger inequality misperceptions. The distance or proximity to rich and poor in society might matter for the magnitude of the misperceptions in the sense that those who are better off or better educated might strive for even higher income, focus on the top incomes but exaggerate these income positions even more.

Some recent studies have also started to investigate individual determinants of left-wing misperceptions. Page and Goldstein (2016) focused on the US and found that respondents underestimated the income inequality with older and more educated people having a smaller misperception of poverty (bottom 10% decile) and age significantly reducing the misperception of top incomes. Cruces, Perez-Truglia, and Tetaz 2013 and Xu and Garand 2010 show that inequality perceptions and, therefor, perception biases are driven by the individual experience from local reference groups. Xu and Garand 2010 also find that more conservative respondents perceived a lower increase in income inequality than centrists.

6.3 The Effect of the Global COVID-19 pandemic on Misperceptions

To capture the potential effects caused by the COVID-19 pandemic on misperceptions, we use two variables: a binary lockdown variable (*Lockdown*) that captures the immediate effects of lockdowns, and a trend variable (*Pandemic*) that captures a more general, accumulated effect of the global pandemic. The *Pandemic* variable simply is a day count for our period of investigation, which goes from March 3 to March 30, 2020. We also use interactions of the pandemic variable with socio-demographic characteristics to identify demographic groups that were disproportionately affected by the pandemic.

Table 3 presents the results of the regressions in which only the *Lockdown* variable is added to the benchmark regressions. Our results remain essentially unchanged concerning the socio-economic determinants of misperceptions. We also observe that respondents' right-wing misperceptions significantly increased after the lockdowns had been introduced. The left-wing misperceptions, however, remained unchanged after the lockdowns.

Table 4 presents the results of the regressions in which both the *Lockdown* and the *Pandemic* variables were added to the benchmark regressions, along with interaction variables between the pandemic variable and the socio-economic variables. Only significant interaction variables

are reported due to space constraints. Table 4 (columns 1-4) show that Spain is the only country showing a significant reduction of most misperceptions (with the exception of the income inequality misperceptions) over the course of the pandemic. Moreover, the pandemic had a disproportionately large effect on women's misperceptions (Columns 2, 3 and 4). These results are consistent with some other recent studies that document the heterogeneous effects of the global pandemic by gender (Arin et al. 2021; Liu et al. 2020; Windsteiger, Ahlheim, and Konrad 2020).

7 Empirical results: Fake News

7.1 Individual Determinants of Fake News Exposure and Sharing

Table 5 (columns 1-3) displays regression results for the individual-level determinants of three fake news indicators: i) how often respondents came across news stories about politics online that they thought were not fully accurate, ii) if they had ever shared a political news story online that they later found out was made up; and iii) if they had ever shared a political news story online that they thought at the time was made up. Regarding the fake news at the country level (columns 1-3), participants of Spain and the United Kingdom report a greater exposure to and sharing of fake news than those in Germany and, particularly, France. Moreover, columns 1-3 indicate that male, married/partnered, young, highly educated respondents are the ones reporting *both* seeing a higher frequency of fake news and sharing them willingly or unwillingly. One prominent variable which separates "misinformation spreaders" from "those who encounter fake news" is income. Whereas high and middle income respondents report higher fake news exposure (column 1), they report less sharing misinformation consciously (column 3). Their increased exposure may be related to their higher usage of social media. We further observe that while highly polarized respondents on both sides of the political spectrum seem to stumble upon fake news more often, as well as inadvertently sharing them, only right-wing respondents admit willingly sharing fake news. Finally, people not in the labor force (mostly students) and single/separated individuals report a lower propensity to share fake news willingly (column 3).

Our results highlight the importance of individual characteristics in understanding recently

elevated misinformation campaigns. These results have some similarities and some differences with previous findings in the literature. Guess, Nagler, and J. Tucker (2019a) and Grinberg et al. (2019) found – similar to our analysis – that it is mostly the more conservative who share fake news. However, both articles argue that older cohorts share much more fake news than the younger ones, while the opposite is true in our case.

We find that those who identify as "right" or "left" on the political spectrum share fake news more often than those in the center. Similarly, Hopp, Ferrucci, and Vargo (2020) also found partial support (on Facebook, but not on Twitter) to connect ideological extremity to fake news sharing. In a similar vein, Allcott and Gentzkow (2017) argued that, in the 2016 US election, fake news was widely shared in favor of Donald Trump. Finally, while some previous studies give digital or media literacy a prominent role for countering fake news (Bulger and Davison 2018; McDougall et al. 2019), our results show that highly educated individuals reported being more willing to intentionally share fake news.

7.2 The Effect of the Global Pandemic on Fake News Exposure and Sharing

To measure the influence of lockdowns on receiving or sharing fake news, we added a lockdown dummy to our benchmark regressions using fake news variables. The empirical results are reported in Table 6. Our results suggest that our survey respondents faced not only a larger exposure to fake news, but also involuntarily shared fake news more often, immediately after the lockdown. This result is in line with literature reporting a higher circulation of fake news during the pandemic (Bridgman et al. 2020; Ceron, de-Lima-Santos, and Quiles 2021). In fact, the massive spread of misleading information about the virus led WHO to affirm they are not only fighting an epidemic but also an infodemic (World Health Organization 2020; Zarocostas 2020; Sander van der Linden, Jon Roozenbeek, and Compton 2020). There is no statistically significant effect of the lockdown, however, on voluntary fake news sharing.

Next, we focused our attention on a more general effect of the pandemic on our variables of interest. To do so, we added the pandemic variable as well as its interactions with the socioeconomic variables. The results are reported in Table 7. As in the previous section, only

the statistically significant interaction terms are reported. Our results suggest that the pandemic positively influenced the fake news exposure of the respondents from the United Kingdom and Spain. We also document that those out of the labor force alongside the unemployed shared fake news deliberately more often as the pandemic took its course.

7.3 Is Fake News Responsible for Misperceptions? The Case of Right-Wing Misperceptions

It is reasonable to assume that increased exposure to fake news may be a driver of misperceptions. In this section, we try to establish an empirical link between misperceptions and fake news. We also take into consideration the impact of the pandemic by including our pandemic variable as well as its interactions. We focus on right-wing misperceptions given that we documented only an increase in Muslim and immigration misperceptions after the lockdown.

We estimate a regression model, which links right-wing misperceptions to (unintentional) fake news sharing. The results are presented in Table 8. We include the two fake news related variables that we show to have increased during the pandemic into the regression. It turns out that elevated unintentional fake news sharing by those who identify as either right- or left-wing during the pandemic may be the culprit for increased Muslim misperceptions, while it is hard to explain the increase in immigration misperceptions with fake news sharing. We do not discard the possibility that the direction of the causality may be the other way around, and those who have higher misperceptions may be more likely to receive or share fake news.[7]

8 Discussion and Limitations

We constructed a novel large dataset combining misperceptions and fake news and presented evidence on which individual-level socioeconomic determinants can predict misperceptions and fake news. The large-scale surveys in France, Germany, Spain, and the United Kingdom, which

[7]To see if this interdependence exists, we estimated a system equation where fake news and misperceptions are determined simultaneously using a 3-stage least squares estimation. The results, which are available upon request, confirm our priors. Not only do those who share fake news more often have higher misperceptions of Islam, but also those who have higher misperceptions share more fake news.

took place in a unique period during the start of the COVID-19 outbreak, enabled us to estimate how the global pandemic affected misperceptions and fake news.

We document that respondents have large misperceptions in all dimensions. Even after controlling for political orientation, consistent with our a priori expectations, we document that women, married low-income and low-educated individuals tend to have the largest misperceptions. Also consistent with our hypotheses, we show that men as well as married, young and, higher educated respondents are those more exposed to fake news and also spread it (intentionally or not) at a higher frequency. High-income earners, despite being exposed to fake news more frequently, share fake news less often. Regarding political orientation, the magnitude of misperception seems to be consistently aligned with the ideology. Whereas right-leaning respondents showed the greatest misperception in both right-wing concerns (immigration and Muslim population), left-leaning participants exhibited the greatest misperception on the income share of the richest. This result is consistent with Halberstam and Knight (2016) who found that users are disproportionately exposed to like-minded information and that information reaches like-minded users more quickly. Regarding fake news, ideologically polarized individuals showed both greater exposure and sharing. However, only right-leaning respondents reported a higher willingness to intentionally share fake news. At the country level, we observe heterogeneous effects at both misperceptions and fake news. While France is leading the magnitude of misperceptions regarding the Muslim population and poverty rate, the United Kingdom has the highest misinformation about income distribution. Spain has the lowest right-wing misperceptions, and is the only country showing a significant reduction during the pandemic in three out of four dimensions. Regarding fake news, respondents of Spain and the United Kingdom reported a greater exposure to and sharing of fake news than those in Germany and, especially, France.

We observe that during the COVID-19 pandemic four variables of interest were elevated: right-wing misperceptions (regarding immigration and muslim populations), fake news frequency, and involuntary sharing of fake news. Contrary to our a priori beliefs, left-wing misperceptions were not elevated due to the pandemic. Finally, we show that the increased misperception of the Muslim population during the pandemic may have been influenced by increased fake news sharing by those who do not identify as centrists. It is also possible that

those who have higher misperceptions are those who follow social media accounts that spread misinformation in line with their political ideology, reinforcing therefore their prior beliefs.

The large and, during the pandemic, even increasing misperceptions raise the question whether policy makers can and should take measures against these biases. Some previous papers on misperceptions investigated the consequences of providing information and thus correcting misperceptions. The evidence so far is inconclusive. Regarding right-wing misperceptions, Alesina, Miano, and Stantcheva (2018) and Hopkins, Sides, and Citrin (2019) found that information provision cannot change people's attitudes towards immigration. Lergetporer, Piopiunik, and Simon (2017) used survey experiments with more than 5,000 university students in Germany and contend that beliefs about refugees' education significantly affect concerns about labor market competition, although these concerns do not translate into general attitudes as economic aspects are rather unimportant for forming attitudes toward refugees. Regarding left-wing misperceptions, Cruces, Perez-Truglia, and Tetaz (2013) and Karadja, Mollerstrom, and Seim (2017) found that providing information on the true degree of income inequality changes the redistributive preferences or respondents. The respondents were asked to assess their own relative position in the income distribution. After having received information on their ranking within the income distribution, those who overestimated their relative position tended to favor more redistribution (Cruces, Perez-Truglia, and Tetaz 2013) and those who underestimated their position wanted to reduce redistribution (Karadja, Mollerstrom, and Seim 2017). However, Lawrence and Sides (2014), who did not ask respondents about their own position in the income scale but only about their estimates of the general poverty rate, found no effect of providing correct information on policy attitudes. Also the information treatment in Engelhardt and Wagener (2018) had little impact on redistributive preferences; only those participants who learned that they were net contributors to the tax transfer system became more averse toward redistribution.

Even though misperceptions may have no direct impact on policy choices, they may have an impact on social outcomes. For instance, Alesina, Carlana, et al. (2018) show that revealing stereotypes may help decreasing discrimination in the context of teachers' bias in grading immigrant children and thus positively contribute to their educational outcomes. Therefore,

our evidence regarding the large magnitude of misperceptions, and the high frequency of fake news should be included in the challenges that both policymakers and academics face in the post-COVID era.

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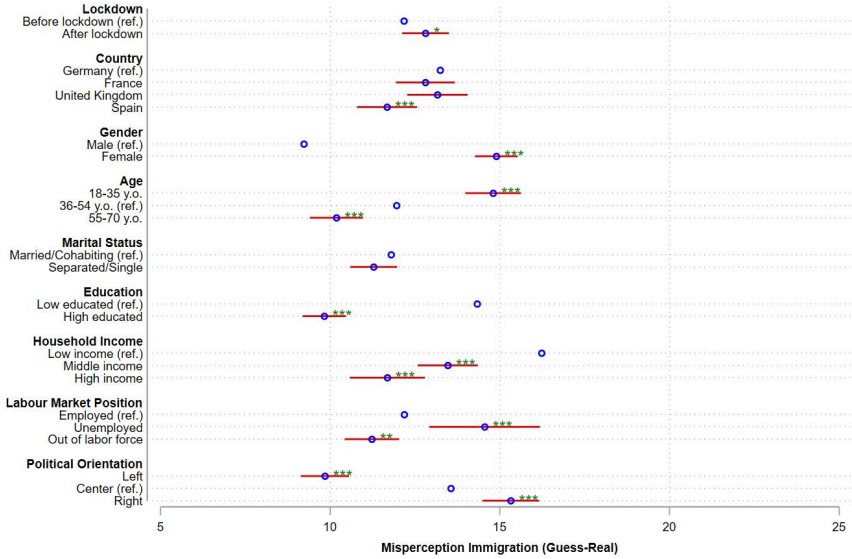
Table 1: Descriptive statistics (N = 18581)

	Mean/Prop.	Freq.	SD	Min.	Max.
Country					
Germany	.272	5056			
France	.244	4529			
United Kingdom	.241	4475			
Spain	.243	4521			
Gender	.522				
Age					
18-35 y.o.	.293	5449			
36-54 y.o.	.401	7453			
55-70 y.o.	.306	5679			
Education	.390				
Marital Status	.405				
Household Income					
Low income	.230	4266			
Middle income	.583	10842			
High income	.187	3473			
Labour Market Position					
Employed	.705	13102			
Unemployed	.052	958			
Out of labor force	.243	4521			
Political Orientation					
Left	.292	5422			
Center	.505	9388			
Right	.203	3771			
Misperception Immigration	12.415		21.477	-17.000	88.000
Misperception Islam	16.628		17.399	-8.000	95.600
Misperception Poverty	11.280		21.669	-18.000	90.000
Misperception Income Richest 10%	13.153		31.637	-25.900	76.100
Fake News Frequency	5.198		2.478	.000	10.000
Shared Fake News	.157				
Shared Fake News Willingly	.086				
Trend	13.026		8.118	1.000	29.000



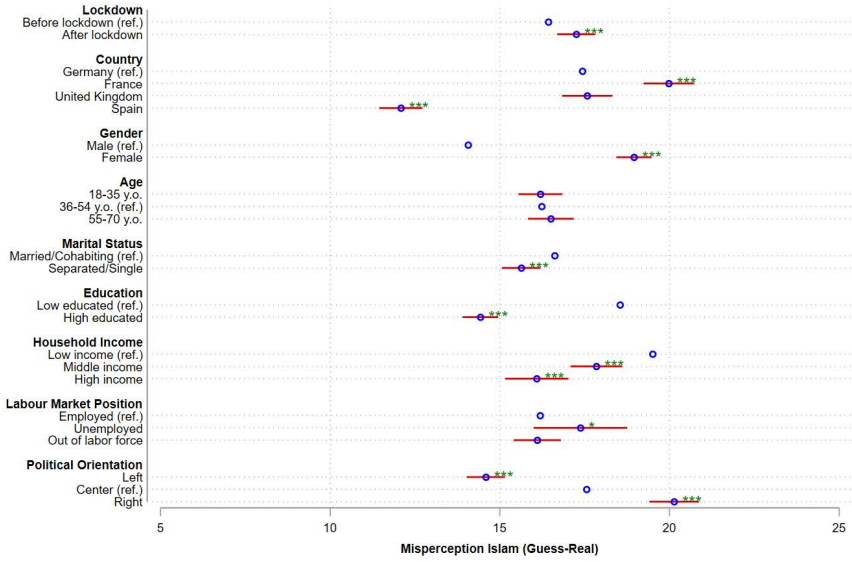
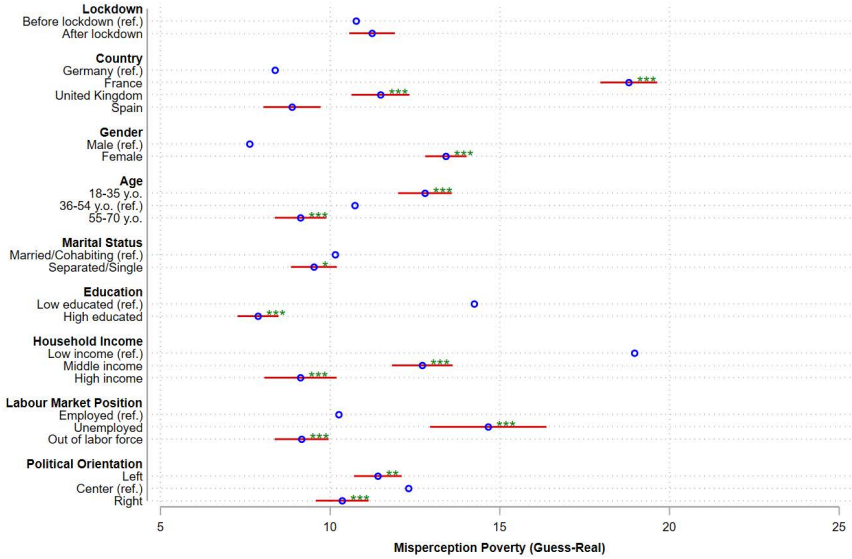


Figure 1: Right-wing Misperception



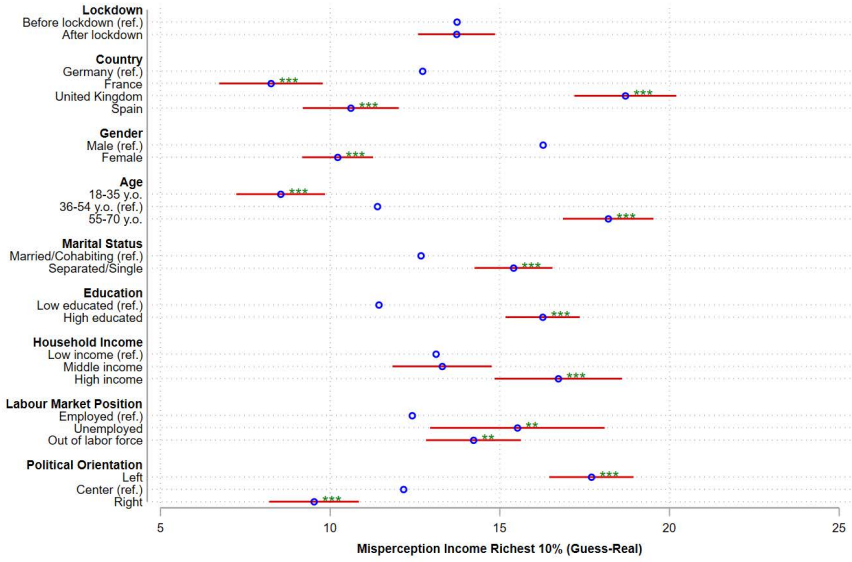


Figure 2: Left-wing Misperceptions

Table 2: Individual Determinants of Misperceptions: Benchmark Regressions

	MI Immigration	MI Islam	MI Poverty	MI Income Richest 10%
	(1)	(2)	(3)	(4)
France (ref:Germany)	-.363 (.441)	2.638*** (.380)	10.477*** (.427)	-4.468*** (.777)
United Kingdom (ref:Germany)	-.117 (.455)	.091 (.379)	3.084*** (.435)	5.977*** (.766)
Spain (ref:Germany)	-1.455*** (.446)	-5.202*** (.321)	.583 (.428)	-2.117*** (.715)
Female (ref:male)	5.703*** (.321)	4.930*** (.265)	5.806*** (.312)	-6.054*** (.533)
18-35 y.o. (ref:36-54 y.o.)	2.770*** (.417)	-.141 (.329)	2.008*** (.402)	-2.848*** (.663)
55-70 y.o. (ref:36-54 y.o.)	-1.801*** (.399)	.230 (.344)	-1.624*** (.386)	6.804*** (.680)
High educated (ref:low edu)	-4.510*** (.325)	-4.119*** (.268)	-6.374*** (.309)	4.830*** (.558)
Separated/Single (ref:Married/Coh)	-.498 (.354)	-.965*** (.291)	-.617* (.345)	2.729*** (.586)
Middle income (ref:low)	-2.786*** (.452)	-1.693*** (.388)	-6.273*** (.456)	.185 (.746)
High income (ref:low)	-4.648*** (.562)	-3.554*** (.473)	-9.920*** (.540)	3.607*** (.954)
Unemployed (ref:employed)	2.349*** (.832)	1.162* (.704)	4.390*** (.876)	3.102** (1.312)
Out of labor force (ref:employed)	-.988** (.410)	-.130 (.355)	-1.120*** (.406)	1.809** (.713)
Left (ref:center)	-3.707*** (.364)	-2.961*** (.287)	-.901** (.359)	5.538*** (.633)
Right (ref:center)	1.765*** (.426)	2.583*** (.372)	-1.958*** (.399)	-2.637*** (.675)
cons	15.009*** (.602)	18.675*** (.490)	13.726*** (.598)	9.288*** (.994)
N	17646	16448	17791	13804
adj. R-sq	.055	.086	.120	.053

Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01.

Table 3: Individual Determinants of Misperceptions: Taking Lockdowns into Account

	MI Immigration	MI Islam	MI Poverty	MI Income Richest 10%
	(1)	(2)	(3)	(4)
After lockdown (ref:before)	.636* (.351)	.824*** (.288)	.470 (.343)	-.011 (.580)
France (ref:Germany)	-.435 (.443)	2.545*** (.380)	10.425*** (.429)	-4.467*** (.779)
United Kingdom (ref:Germany)	-.080 (.455)	.140 (.379)	3.110*** (.435)	5.976*** (.767)
Spain (ref:Germany)	-1.566*** (.452)	-5.349*** (.324)	.501 (.431)	-2.115*** (.720)
Female (ref:male)	5.672*** (.321)	4.888*** (.265)	5.783*** (.312)	-6.053*** (.533)
18-35 y.o. (ref:36-54 y.o.)	2.846*** (.419)	-.040 (.331)	2.065*** (.404)	-2.849*** (.667)
55-70 y.o. (ref:36-54 y.o.)	-1.771*** (.399)	.269 (.344)	-1.601*** (.387)	6.803*** (.681)
High educated (ref:low edu)	-4.505*** (.325)	-4.115*** (.268)	-6.371*** (.309)	4.829*** (.558)
Separated/Single (ref:Married/Coh)	-.514 (.354)	-.986*** (.291)	-.628* (.345)	2.729*** (.586)
Middle income (ref:low)	-2.764*** (.452)	-1.659*** (.389)	-6.255*** (.456)	.184 (.747)
High income (ref:low)	-4.546*** (.564)	-3.419*** (.476)	-9.844*** (.543)	3.605*** (.958)
Unemployed (ref:employed)	2.371*** (.832)	1.189* (.704)	4.404*** (.876)	3.101** (1.312)
Out of labor force (ref:employed)	-.954** (.409)	-.084 (.355)	-1.095*** (.406)	1.808** (.714)
Left (ref:center)	-3.711*** (.364)	-2.968*** (.287)	-.904** (.359)	5.538*** (.633)
Right (ref:center)	1.766*** (.426)	2.580*** (.372)	-1.957*** (.399)	-2.637*** (.675)
cons	14.793*** (.612)	18.392*** (.502)	13.564*** (.609)	9.292*** (1.019)
N	17646	16448	17791	13804
adj. R-sq	.056	.086	.121	.053

Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01.

Table 4: Individual Determinants of Misperceptions: The Effects of the Global Pandemic

	MI Immigration	MI Islam	MI Poverty	MI Income Richest 10%
	(1)	(2)	(3)	(4)
After lockdown (ref:before)	1.686** (.729)	.893 (.598)	1.143 (.697)	.153 (1.225)
France (ref:Germany)	-.284 (.816)	2.288*** (.698)	11.064*** (.794)	-6.086*** (1.439)
United Kingdom (ref:Germany)	.066 (.805)	.480 (.671)	3.351*** (.775)	4.786*** (1.359)
Spain (ref:Germany)	1.918** (.959)	-3.932*** (.685)	2.319** (.914)	-3.182** (1.494)
Female (ref:male)	4.898*** (.611)	3.889*** (.519)	4.758*** (.592)	-7.506*** (1.023)
18-35 y.o. (ref:36-54 y.o.)	2.857*** (.419)	.013 (.332)	2.088*** (.404)	-2.805*** (.667)
55-70 y.o. (ref:36-54 y.o.)	-1.768*** (.400)	.244 (.345)	-1.610*** (.388)	6.807*** (.682)
High educated (ref:low edu)	-4.664*** (.327)	-4.193*** (.270)	-6.462*** (.311)	4.824*** (.562)
Separated/Single (ref:Married/Coh)	-.544 (.354)	-1.010*** (.291)	-.641* (.346)	2.703*** (.586)
Middle income (ref:low)	-2.862*** (.453)	-1.686*** (.390)	-6.282*** (.457)	.246 (.748)
High income (ref:low)	-4.464*** (.565)	-3.358*** (.477)	-9.777*** (.543)	3.659*** (.960)
Unemployed (ref:employed)	2.439*** (.832)	1.200* (.703)	4.423*** (.877)	3.079** (1.312)
Out of labor force (ref:employed)	-1.025** (.411)	-.109 (.357)	-1.115*** (.408)	1.741** (.716)
Left (ref:center)	-3.699*** (.364)	-2.958*** (.287)	-.897** (.359)	5.548*** (.633)
Right (ref:center)	1.779*** (.426)	2.583*** (.372)	-1.950*** (.398)	-2.636*** (.675)
Pandemic	-.035 (.056)	-.022 (.044)	-.035 (.053)	-.138 (.093)
France x Pandemic	-.020 (.054)	.021 (.047)	-.054 (.053)	.125 (.094)
United Kingdom x Pandemic	-.015 (.056)	-.036 (.046)	-.026 (.054)	.080 (.094)
Spain x Pandemic	-.248*** (.062)	-.099** (.045)	-.132** (.060)	.079 (.096)
Female x Pandemic	.065 (.041)	.081** (.034)	.083** (.039)	.114* (.067)
cons	15.040*** (.850)	18.656*** (.685)	13.839*** (.824)	10.979*** (1.424)
N	17646	16448	17791	13804
adj. R-sq	.056	.087	.121	.053

Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01.

Table 5: The Individual Determinants of Fake News: Benchmark Regressions

	Fake News Frequency	Shared Fake News	Shared Fake News Willingly
	(1)	(2)	(3)
France (ref:Germany)	-.428*** (.051)	-.015** (.006)	.009* (.005)
United Kingdom (ref:Germany)	.514*** (.050)	.055*** (.007)	.062*** (.006)
Spain (ref:Germany)	.676*** (.050)	.207*** (.009)	.076*** (.006)
Female (ref:male)	-.189*** (.036)	-.042*** (. 005)	-.038*** (.004)
18-35 y.o . (ref:36-54 y.o.)	.488*** (.044)	.083*** (.007)	.077*** (.006)
55-70 y.o. (ref:36-54 y.o.)	-.001 (.047)	.006 (.007)	-.004 (.005)
High educated (ref:low edu)	.406*** (.037)	.016*** (.006)	.011** (.005)
Separated /Single (ref:Married/Coh)	-.171*** (.039)	-.010* (.006)	-.018*** (.005)
Middle income (ref:low)	.190*** (.049)	.004 (.007)	-.003 (.006)
High income (ref:low)	.270*** (.064)	-.016* (.009)	-.019** (.008)
Unemployed (ref:employed)	-.215** (.087)	.007 (.014)	.014 (.011)
Out of labor force (ref:employed)	-.145*** (.047)	.001 (.007)	- .015*** (.005)
Left (ref :center)	.233*** (.042)	.014** (.006)	-.003 (.005)
Right (ref:center)	.643*** (.047)	.095*** (.008)	.072*** (.006)
cons	4.566*** (.067)	.071*** (.010)	.046*** (.007)
N	18496	17224	17572
adj. R-sq	.065	.079	.048

Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01.

Table 6: The Individual Determinants of Fake News: The Effects of the Lockdowns

	Fake News Frequency	Shared Fake News	Shared Fake News Willingly
	(1)	(2)	(3)
After lockdown (ref:before)	.110*** (.039)	.036*** (.006)	.007 (.005)
France (ref:Germany)	-.440*** (.052)	-.019*** (.006)	.008* (.005)
United Kingdom (ref:Germany)	.519*** (.050)	.057*** (.007)	.062*** (.006)
Spain (ref:Germany)	.656*** (.050)	.201*** (.009)	.075*** (.006)
Female (ref:male)	-.195*** (.036)	-.044*** (. 005)	-.039*** (.004)
18-35 y.o. (ref:36-54 y.o.)	.501*** (.044)	.088*** (.007)	.078*** (.006)
55-70 y.o. (ref:36-54 y.o.)	.004 (.047)	.008 (.007)	-.004(.005)
High educated (ref:low edu)	.407*** (.037)	.016*** (.006)	.011** (.005)
Separated /Single (ref:Married/Coh)	-.173*** (.039)	-.011* (.006)	-.018*** (.005)
Middle income (ref:low)	.195*** (.049)	.005 (.007)	-. 003 (.006)
High income (ref:low)	.288*** (.064)	-.010 (.009)	- .018** (.008)
Unemployed (ref:employed)	-.212** (.087)	.007 (.014)	.014 (.011)
Out of labor force (ref:employed)	-.139*** (.047)	.003 (.007)	- .014*** (.005)
Left (ref :center)	.233*** (.042)	.014** (.006)	-.003 (.005)
Right (ref:center)	.643*** (.047)	.095*** (.008)	.072*** (.006)
cons	4.527*** (.069)	.059*** (.010)	.044*** (.008)
N	18496	17224	17572
adj. R-sq	.066	.081	.048

Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01.

Table 7: The Individual Determinants of Fake News: The Effects of the Global Pandemic

	Fake News Frequency	Shared Fake News	Shared Fake News Willingly
	(1)	(2)	(3)
After lockdown (ref:before)	-.006 (.081)	-.001 (.012)	.002 (.009)
France (ref:Germany)	-.386*** (.096)	-.018 (.011)	.000 (.009)
United Kingdom (ref:Germany)	.393*** (.090)	.050*** (.012)	.058*** (.010)
Spain (ref:Germany)	.484*** (.108)	.150*** (.019)	.061*** (.014)
Female (ref:male)	-.146** (.069)	-.055*** (.010)	-.048*** (.008)
18-35 y.o. (ref:36-54 y.o.)	.549*** (.058)	.091*** (.009)	.082*** (.007)
55-70 y.o. (ref:36-54 y.o.)	-.058 (.060)	.002 (.008)	-.009 (.007)
High educated (ref:low edu)	.412*** (.037)	.017*** (.006)	.011** (.005)
Separated/Single (ref:Married/Coh)	-.170*** (.039)	-.010* (.006)	-.018*** (.005)
Middle income (ref:low)	.203*** (.050)	.007 (.007)	-.002 (.006)
High income (ref:low)	.278*** (.064)	-.011 (.009)	-.017** (.008)
Unemployed (ref:employed)	-.408** (.167)	-.004 (.023)	-.020 (.019)
Out of labor force (ref:employed)	-.225*** (.081)	-.023** (.011)	-.028*** (.009)
Left (ref:center)	.232*** (.042)	.014** (.006)	-.003 (.005)
Right (ref:center)	.638*** (.047)	.094*** (.008)	.072*** (.006)
Pandemic	-.001 (.007)	.000 (.001)	-.001 (.001)
France x Pandemic	-.004 (.006)	.000 (.001)	.001 (.001)
United Kingdom x Pandemic	.012** (.006)	.001 (.001)	.000 (.001)
Spain x Pandemic	.012* (.007)	.004*** (.001)	.001 (.001)
Female x Pandemic	-.006 (.005)	.001 (.001)	.001 (.001)
Age x Pandemic	.005 (.003)	.000 (.000)	.000 (.000)
Unemployed x Pandemic	.014 (.010)	.001 (.002)	.002** (.001)
Out of labor force x Pandemic	.007 (.005)	.002*** (.001)	.001* (.001)
cons	4.524*** (.098)	062*** (.014)	.057*** (.011)
N	18496	17224	17572
adj. R-sq	.067	.082	.048

Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01.

Table 8: Linking Misperceptions to Fake News: OLS Estimation

	MI Immigration	MI Islam
Shared fake news (ref: did not share)	3.153* (1.841)	.430 (1.700)
Fake news frequency	-.124 (.187)	-.078 (.165)
Pandemic	-.047 (.067)	.029 (.059)
France (ref:Germany)	-.148 (.448)	2.690*** (.384)
United Kingdom (ref:Germany)	-.127 (.464)	.060 (.386)
Spain (ref:Germany)	-1.645*** (.492)	-5.669*** (.348)
Female (ref:male)	5.754*** (.336)	4.878*** (.276)
18-35 y.o. (ref:36-54 y.o.)	2.650*** (.436)	-.099 (.342)
55-70 y.o. (ref:36-54 y.o.)	-1.670*** (.412)	.253 (.352)
High educated (ref:low edu)	-4.703*** (.337)	-4.266*** (.275)
Separated/Single (ref:Married/Coh)	-.542 (.364)	-.998*** (.300)
Middle income (ref:low)	-2.702*** (.467)	-1.606*** (.398)
High income (ref:low)	-4.303*** (.580)	-3.376*** (.487)
Unemployed (ref:employed)	2.196** (.863)	1.331* (.739)
Out of labor force (ref:employed)	-.984** (.423)	-.033 (.365)
Left (ref:center)	-4.622*** (1.775)	-3.233** (1.439)
Right (ref:center)	-4.380** (1.978)	-.100 (1.740)
Left x Shared fake news	.203 (2.526)	-.367 (2.131)
Center x Shared fake news	1.588 (2.417)	3.798* (2.171)
Shared fake news x Pandemic	-.036 (.099)	-.086 (.086)
Left x Pandemic	.191 (.117)	.003 (.094)
Right x Pandemic	.361*** (.134)	.173 (.115)
Left x Shared fake news x Pandemic	.031 (.148)	.224* (.122)
Right x Shared fake news x Pandemic	.102 (.162)	.276* (.144)
Left x Fake news frequency	.153 (.320)	.212 (.264)
Right x Fake news frequency	.893** (.349)	.433 (.309)
Fake news frequency x Pandemic	.013 (.013)	.005 (.011)
Left x Fake news frequency x Pandemic	-.036* (.021)	-.012 (.017)
Right x Fake news frequency x Pandemic	-.054** (.024)	-.031 (.021)
cons	14.787*** (1.139)	18.036*** (.997)
N	16476	15397
adj. R-sq	.059	.087

Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01.

Appendix A UK version of the questionnaire

Q1 Were you born in the United Kingdom? Yes / No

Q2 What is your gender? Male / Female

Q3 What is your age?

Q4 What is your gross weekly household income? Less than £400 / £400–£600 / £600–£1.000 / More than £1.000

Q5 Please indicate your marital status. Single / Couple, Married / Separated or Divorced / Widowed

Q6 How many children do you have? I do not have children / 1 / 2 / 3 / 4 / 5 / More than 5

Q7 Which category best describes your highest level of education? Compulsory Education / High School / University (but not finished) / Bachelor's degree / Master Degree / Doctoral Degree

Q8 Which of these descriptions best describes your situation? Please select ONLY one. In paid work / In education / Self-employed / Unemployed and actively looking for a job / Unemployed, wanting a job but not actively looking for a job / Permanently sick or disabled / Retired / In community or military service / Doing housework, looking after children or other persons / Refusal

Q9 Have you ever had a paid job? Yes / No / Refusal-Don't know

Q10 In what year were you last in a paid job?

Q11 In your main job are/were you. . . Please select ONLY one. An employee / Self-employed / Working for your own family's business / Refusal-Don't know

Q12 How many employees (if any) do/did you have?

Q13 Do/did you have a work contract of...Unlimited duration / Limited duration / Do/did you have no contract / Refusal-don't know

Q14 Including yourself, about how many people are/were employed at the place where you usually work/worked?

Q15 In your main job, do/did you have any responsibility for supervising the work of other employees? Yes / No / Refusal-Don't know

Q16 Please indicate on a scale of 0-10 how much the management at your work allows/allowed you to influence policy decisions about the activities of the organization

Q17 Have you ever been unemployed and seeking work for a period of more than three months in the last five years? Yes / No / Refusal-Don't know

Q18 Have any of these periods lasted for 6 months or more? Yes / No / Refusal-Don't know

Q19 Please consider the total income of all household members. What is the main source of income in your household? Wages or salaries / Income from self-employment / Pensions / Unemployment/redundancy benefit / Any other social benefits or grants / Income from investment, savings, insurance or property / Income from other sources / Refusal/Don't know

Q20 Which of the descriptions comes closest to how you feel about your household's income nowadays? Living comfortably on present income / Coping on present income / Finding it difficult on present income / Finding it very difficult on present income / Refusal-Don't know

Q21 Please indicate on a scale of 0-10 how interested you would say you are in politics

Q22 Please indicate on a scale of 0-10 how much you would say the political system in the United Kingdom allows people like you to have a say in what the government does

Q23 Please indicate on a scale of 0-10 how able you think you are to take an active role in a group involved with political issues

Q24 Please indicate on a scale of 0-10 how confident you are in your own ability to participate in politics

Q25 Please indicate on a scale of 0–10 how much you personally trust each of these institutions (0 = Do not trust at all; 10 = Complete trust). Country's parliament / The legal system / The police / Politicians / Political parties / The European Parliament / The United Nations

Q26 Some people don't vote nowadays for one reason or another. Did you vote in the last national election in December 12th, 2019? Yes / No / Refusal-Don't know

Q27 Which party did you vote for in that election? Conservative / Labour / Liberal Democrat / UKIP / Paid Cymru / Green Party / SNP / Brexit Party / Other (write in) / Refusal/Don't know

Q28 Which party do you plan to vote in the next national election? Conservative / Labour / Liberal Democrat / UKIP / Paid Cymru / Green Party / SNP / Brexit Party / Other (write in) / Refusal/Don't know

Q29 In politics people sometimes talk about "left" and "right". Please indicate on a scale of 0-10 where you would place yourself (0 = Left; 10 = Right).

Q30 Please indicate on a scale of 0-10 how religious you think you are (0= Not religious at all; 10 = Very religious) Please indicate on a scale of 0–10 whether you agree or disagree with the following statements (0= Completely disagree; 10 = Completely agree).

Q31 The opinion of ordinary people is worth more than that of experts and politicians.

Q32 Politicians should listen more closely to the problems the people have.

Q33 Ministers should spend less time behind their desks, and more among the ordinary people.

Q34 People who have studied for a long time and have many diplomas do not really know what makes the world go round. For the next two questions, notice that we consider an ethnic group as a community or population made up of people who share a common cultural background.

Q35 Please indicate on a scale of 0–10 to what extent you think the United Kingdom should allow people of the same race or ethnic group than the majority of the British people to come and live here (0 = Allow none; 10 = Allow many to come and live here).

Q36 Please indicate on a scale of 0–10 to what extent you think the United Kingdom should allow people of the different race or ethnic group than the majority of the British people to come and live here (0 = Allow none; 10 = Allow many to come and live here).

Q37 Please indicate on a scale of 0–10 to what extent you think the United Kingdom should allow people of different religious faith than the majority of the British people to come and live here (0 = Allow none; 10 = Allow many to come and live here).

Q38 Please indicate on a scale of 0–10 to what extent you think the United Kingdom should allow people from poorer countries outside Europe to come and live here (0 = Allow none; 10 = Allow many to come and live here).

Q39 Please indicate on a scale of 0–10 to what extent you think the United Kingdom has become a worse or a better place to live by people coming to live here from other countries (0 = Worse place to live; 10 = Better place to live).

Q40 Typically, how often do you access news? By news we mean national, international, regional/local news and other topical events accessed via radio, TV, newspaper or online. (Several times a day / Once a day / Several times a week / Once a week / Several times a month / Once a month / Less often than once a month / Whenever I come across by coincidence / Almost never / Never) Thinking about your news habits, please indicate on a scale of 0-10 how often do you. . . (0 = Never; 10 = Always).

Q41 Read any newspapers in print?

Q42 Listen to news on the radio?

Q43 Watch television news?

Q44 Get news from a social media site (such as Facebook, Twitter, or Snapchat)?

Q45 Get news from a news website or app?

Q46 Which, if any, of the following sources of information do you use to keep up with political issues? Please select all that apply (Friends, relatives or colleagues / National printed newspapers and/or their online sites/apps / Radio broadcasters and/or online sites/apps / TV broadcasters and/or online sites/apps / Politically focused magazines and/or online sites/apps / Political parties and/or their newsletters or online sites / Online specialist sites or political blogs / Social media such as Facebook and Twitter / Don't know / None of these)

Q47 Please indicate on a scale of 0-10 how much trust and confidence you have in the mass media – such as newspapers, TV and radio – when it comes to reporting the news fully, accurately and fairly (0 = None at all; 10 = A great deal).

Q48 Please indicate on a scale of 0-10 how much trust and confidence you have in the social media – such as Twitter, Facebook, Instagram and YouTube – when it comes to reporting the news fully, accurately and fairly (0 = None at all; 10 = A great deal).

Q49 Please indicate below whether you get news about politics and current affairs regularly from each of the following sources. For each item, please indicate on a scale of 0-10 if it is something you do regularly (0 = Never; 10 = Always). [The Guardian / The Sunday Times / The Times / Daily Mail / The Independent / The Sun / Channel 4 / BBC / ITV / Film 4]

Q50 Please indicate on a scale of 0-10 how much trust and confidence you have in the following sources when it comes to reporting the news fully, accurately and fairly (0 = None at all; 10 = A great deal). [The Guardian / The Sunday Times / The Times / Daily Mail / The Independent / The Sun / Channel 4 / BBC / ITV / Film 4]

Q51 On a typical day, about how much time do you spend using the internet on a computer, tablet, smartphone or other device, whether for work or personal use? Please give your answer in hours and minutes.

Q52 Please indicate on a scale of 0-10 how often you come across news stories about politics online that you think are not fully accurate (0 = Never; 10 = Always).

Q53 Have you ever shared a political news story online that you later found out was made up? (Yes / No / No answer)

Q54 Have you ever shared a political news story online that you thought at the time was made up? (Yes / No / No answer) As you may have heard, there have recently been some instances of so called "fake news stories" circulating widely online. Please indicate on a scale of 0-10 how much responsibility each of the following has in trying to prevent made up stories from gaining attention (0 = No responsibility at all; 10 = A great deal of responsibility).

Q55 Members of the public

Q56 The government, politicians, and elected officials

Q57 Social networking sites like Facebook, Twitter, WhatsApp and search sites like Google

Q58 Media

Q59 Please indicate on a scale of 0-10 how confident you are in your own ability to recognize news that is made up (0 = Not at all confident; 10 = Very confident).

Q60 Please indicate on a scale of 0-10 how much you think these kinds of news stories leave people confused about the basic facts of current issues and events (0 = Not at all; 10 = A great deal).

Please indicate on a scale of 0–10 whether you agree or disagree with the following statements (0= Completely disagree; 10 = Completely agree).

Q61 There is too much moral decay today

Q62 The sense of belonging together that we used to have is irrevocably lost

Q63 Parents no longer adequately educate their children

Q64 People don't care for each other any more

Q65 The United Kingdom will face a situation of ever-increasing job insecurity

Q66 Even more enterprises will move to low-wage countries, threatening employment in the United Kingdom.

Q67 In order to face the competition of other countries we will have to dismantle our welfare state.

Q68 Multinational enterprises will become increasingly powerful, small enterprises are bound to suffer.

Q69 Opening the European frontiers means that our employers will prefer the low-cost workers from poorer countries to our own workers.

Q70 In the future we will become even less open and tolerant with regard to people from other cultures

Q71 The relationship between Christians and Muslims is bound to become violent in the future

Q72 The relationship between Christians and Jews is bound to become violent in the future

Q73 You can generally trust the people who run our government to do what is right.

Q74 For the next question, please consider globalization as the increased trade between countries in goods, services, and investments. Please indicate on a scale of 0–10 whether you think globalization has had a negative or a positive effect on each of the following (0= Completely negative effect; 10 = Completely positive effect) [British factory workers / Multinational corporations based in the United Kingdom / You and your immediate family / The British economy] Please indicate on a scale of 0–10 whether you agree or disagree with the following statements (0= Completely disagree; 10 = Completely agree).

Q75 It is important to live in secure and safe surroundings.

Q76 People should follow rules at all times, even when no-one is watching.

Q77 It is important that the government is strong and ensures safety against all threats.

Q78 It is important to follow traditions and customs handed down by religion or family.

In the following questions, we refer to legal immigrants as people who were not born in the United Kingdom and legally moved here at a certain point of their life. We are NOT considering irregular migration.

Q79 Think about all of the currently living in the United Kingdom. Out of every 100 people in the United Kingdom, how many are born in another country?

Q80 Fill in the boxes below to indicate how many out of every 100 people in the United Kingdom you think practice each religion. Christianity; Islam; Buddhism; Hinduism; Other Religions/Atheist/No religious affiliation

Q81 Out of every 100 people, who are between 20 and 64 years old, in the United Kingdom how many are currently unemployed? By unemployed we mean people who are currently not working but searching for a job (and maybe unable to find one). Now let's compare this to the number of unemployed among foreign-born people. Out of every 100 foreign-born people how many do you think are currently unemployed?

Q82 The poverty line is the estimated minimum level of income needed to secure the necessities of life. Out of every 100 adult people born in the United Kingdom, how many live below the poverty line? Let's compare this to poverty among legal immigrants. Out of every 100 legal immigrants in the United Kingdom today, how many do you think live below the poverty line?

Q83 The International Organization for Migration (IOM) defines irregular migration as "movement that takes place outside the regulatory norms of the sending, transit and receiving country". A migrant in an irregular situation may fall within one or more of the following circumstances: He or she may enter the country irregularly; he or she may reside in the country irregularly; he or she may be employed in the country irregularly. Think about the evolution of the irregular migration flows in Europe in the last 3 years. It has increased over time / It has decreased over time / It has kept constant over time / Don´t know

Q84 Think about the evolution of detections of illegal border crossing at the EU's external borders in the last 3 years. It has increased over time / It has decreased over time / It has kept constant over time / Don´t know

Q85 How many Islamist terrorists do you think have been arrested in the United Kingdom in 2018?

Q86 How many people do you think have been killed during terror attacks committed by Islamist terrorists in the United Kingdom in the last 5 years?

Q87 Please indicate on a scale of 1–10 whether you agree or disagree with the following statement (o = Completely disagree; 10 = Completely agree): Most crimes in the UK are committed by foreigners.

Q88 What percentage of the prison population in the United Kingdom are foreign national prisoners?

Q89 What do you think is the income share of the poorest 20% of all people living in the United Kingdom?

Q90 What do you think is the income share of the richest 10% of all people living in the United Kingdom?

Q91 How large is the share of taxes and social contributions in percentage of GDP in the United Kingdom?

Q92 According to the share of taxes and social contributions as a percentage of GDP, in which position do you think the United Kingdom is among the 28 Union European countries? Notice that a higher position in the list implies a larger share.

Q93 Please consider corruption in a broad sense, including offering, giving, requesting and accepting bribes or kickbacks, valuable gifts and important favors, as well as any abuse of power for private gain. Transparency International is the leading global civil organization on the fight against corruption. Each year they elaborate a Corruption Perceptions Index which ranks 180 countries and territories by their perceived levels of public sector corruption according to experts and business people. In which position do you think the United Kingdom is among the 28 Union European countries?

Q94 There are people who tend to be towards the top of our society and people who tend to be towards the bottom. Below is a scale that runs from top to bottom. On a scale of 1–10 Where you would put yourself (1 = Bottom of our society; 10 = Top of our society). Please indicate on a scale of 0-10 to what extent you agree with the following statements (0= Completely disagree; 10 = Completely agree).

Q95 I experience a general sense of emptiness

Q96 There are many people I can trust completely

Q97 I miss having people around me.

Q98 I often feel rejected.

Q99 I have enough opportunities to advance in life

Q100 I know exactly where I feel at home and where I belong

Appendix B Definitions and Data Sources of Actual Statistics

To compare the perceptions of our respondents with actual statistics, we used the following definitions and data sources.

B.1 Foreign born

For the question "Out of every 100 people in [country], how many are born in another country?", we used the share of foreign-born in the entire population. Data are taken from Eurostat, Population and Migration Statistics, code: migr_pop3ctb. We employed the most recent data available at the time of the survey, which were the population figures for 2018. The share of foreign born amounts to 12% in France, 17% in Germany, 13% in Spain and 14% in the UK.

B.2 Muslim population

The respondents' estimate for the Muslim share was captured by the question "How many out of every 100 people in [country] you think practice each religion." There is no uniform database to cover the actual share of people practicing Islam. In Germany, the share of the Muslim population is 5.1%; the estimate refers to 2018 and is taken from *Forschungsgruppe Weltanschauungen in Deutschland* (https://fowid.de/meldung/religionszugehoerigkeiten-2018). For France and UK, we relied on the CIA World Factbook (https://www.cia.gov/the-world-factbook/countries/). The median estimate for France is 8% and refers to 2015. For the UK, the most recent estimate is from 2011 with a value of 4.4%. The number of Muslims residing in Spain is 2,091,656, according to the Demographic Study of the Muslim Population, prepared by the Union of Islamic Communities of Spain (UCIDE) and by the Andalusian Observatory, which collect data as of December 31, 2019 (http://observatorio.hispanomuslim.es/estademograf.pdf). With a total population of 47 m. (https://www.ine.es/jaxiT3/Datos.htm?t=31304), Spain has a Muslim share of 4% in the entire population.

B.3 Poverty

Respondents were asked "The poverty line is the estimated minimum level of income needed to secure the necessities of life. Out of every 100 adult people born in [country], how many live below the poverty line?". Eurostat sets this threshold of being at risk of poverty at 60% of median equivalised income after social transfers. We used the poverty rate of the population aged 18 and over from Eurostat (Quality of life, code: ilc_li31). In March 2020, the most recent data were available for the year 2018 (2017 for UK). The poverty rates were 10% in France, 16% in Germany, 18% in Spain and 16% in the UK.

B.4 Income share of the top decile

We elicited the respondents' estimates for the income share of the top 10% earners by asking: "What do you think is the income share of the richest 10% of all people living in [country]?" We contrast these estimates with data from Eurostat (Quality of life, code: ilc_di01), which provides the distribution of incomes by quantiles. The income shares for 2018 (available in March 2020) were 24% in France, 26% in Germany, 24% in Spain and 26% in the UK.

Appendix C Main Descriptive Statistics

Table C.1: Comparing Sample Statistics and Population Statistics (whole sample)

	Germany (DE)		Spain (ES)		France (FR)		United Kingdom (UK)	
	Sample	Pop	Sample	Pop	Sample	Pop	Sample	Pop
Female	53.5	49.6	51.0	50.2	53.7	51.1	50.6	50.3
18-35y.o.	30.0	31.3	28.3	28.3	26.5	32.2	32.4	35.1
36-54y.o.	39.9	37.0	43.9	43.6	39.8	37.7	36.8	37.5
55-70y.o.	30.1	31.7	27.8	28.1	33.7	30.1	30.7	27.4
High Educated	34.1	28.0	41.0	37.4	38.8	37.4	42.8	43.3
Married/Coh.	57.2	61.1	60.5	61.5	61.4	63.5	59.2	63.1
Low income	21.4	24.4	17.4	16.9	24.0	31.0	29.3	27.0
Middle income	63.8	59.4	65.0	63.4	49.1	45.0	54.9	43.0
High income	14.9	16.3	17.6	19.7	26.9	24.0	15.9	30.0
Employed	77.4	75.4	67.2	63.6	63.9	65.8	72.8	75.3
Unemployed	2.1	2.3	9.1	9.9	5.1	5.7	4.6	2.4
Out of labor force	20.5	22.2	23.7	26.5	31.0	28.4	22.6	22.3

Notes: This table shows summary statistics from our sample alongside representative statistics of population in each country. Data for gender, age, employed, household type and unemployed come from Eurostat. Eurostat is the statistical office of the European Union: `https://ec.europa.eu/eurostat/`. "Married/Coh." captures the share of the adult population living as a couple; the data for the entire population is taken from the Labor Force Statistics (*LFST_HHNHTYCH*, number of private households by household composition). The education data also comes from the Labor Force survey (*LFSA_PGAED*, population by sex, age and educational attainment level) and refers to the population aged 20-64. For income data the sources are: 1) For France: OECD (`https://stats.oecd.org/`). Income levels (monthly net household income) are: less than 1500€; 1500€–3000€; more than 3000€; 2) For Germany: National Statistics Institute (`https://www.destatis.de/DE/Home/_inhalt.html`). Income levels (monthly net household income) are: less than 1500€; 1500€–4500€; more than 4500€; 3) For Spain: National Statistics Institute (`https://www.ine.es/`). Income levels (monthly net household income) are: less than 1000€; 1000€–3000€; more than 3,000€; 4) For the United Kingdom: National Statistics Institute (`https://www.gov.uk/search/research-and-statistics`). Income levels (gross weekly household income) are: less than £400; £400–£1000; more than £1000. Employment data is taken from the labor force survey (population by sex, age, citizenship and labour status, *LFSQ_PGANWS*). Employed category also includes self-employed.

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