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# **Social Effects of the Vote of the Majority: A Field-Experiment on the Brexit-Vote**

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# Social Effects of the Vote of the Majority: A Field-Experiment on the Brexit-Vote\*

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## Abstract

The 2016 EU referendum result -the so-called Brexit vote-was widely perceived as a statement against immigration. We conducted a field-experiment to test whether the Brexit vote triggered anti-social attitudes. In a computerized quiz, our (non-deceptive) intervention randomized the information of whether the local majority voted to Leave or to Remain in the EU. We find that such information in support of Brexit increased negative attitudes towards immigrants. Moreover, the impactful treatments inhibited (rather than reinforced) individuals' pre-existing views to conform to the vote of the majority. Our findings provide insight into the effects of referenda results in changing individuals' attitudes.

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## Non-technical summary

The UK is scheduled to leave the EU this year. The current plans include the end of free movement. According to the Prime Minister, May, this is crucial in delivering the Brexit for which people voted in 2016. In fact, the Brexit results were widely perceived as a statement against immigration, voiced by 17 million in the country.

Did the Brexit-vote change citizens' attitudes towards immigrants living in the UK?

The information – inferred by the Referenda results – on the population's views about immigration could have triggered a change. Individuals could have adapted their attitudes accordingly, with an empowerment of anti-social attitudes – in line with the view that the Brexit result unearthed racism – or by refraining pre-existent views and attitudes in a way to conform to the vote of the majority.

We conducted a field-experiment among 342 individuals in the South East of England in 2017-18, to test whether the Brexit vote had triggered anti-social attitudes towards immigrants.

Using a computerized quiz, we provided truthful information on how the local majority voted, but on *selected* constituencies. These were selected in a *seemingly random way* by the computer. We made use of the fact that although most people might know that 52% voted to Leave, less is known the local support for Brexit, so we were providing novel information.

For one group, the 'Remain', individuals were informed about referenda results for nearby constituencies whose majority voted to remain in the EU. The 'Leave' group, were informed about nearby constituencies where the majority voted to leave the EU, and for the control group, we informed about constituencies' demographic composition. Individuals generalised the information we gave – that the local majority voted in favour or against the UK to leave the EU – to other places in the country. Overall, individuals assigned to the 'Leave' condition guessed that the percentage of votes to leave the EU was 18 percentage points higher, on average, than individuals assigned to the 'Remain' condition.

We use this experiment to investigate how the perception of a larger local support for Brexit affects individuals' extrinsic and intrinsic attitudes towards immigrants in the UK. We find *no* impacts on individuals' intrinsic prejudice, measured by Implicit Association Tests – a test used in social psychology, that measures views at an unconscious level. However, we did detect effects of the information about how the majority voted – on some extrinsic attitudes towards immigrants. These are visible in self-reported views on policies and in real money allocations among participants.

Some of our main findings are:

**We find no impact of the Brexit-vote on the demand for more restricted immigration policies.** No effects were noticed on the demand for quotas for settlement for Europeans, quotas for settlement for non-Europeans or establishment of targets to reduce immigration. We also find no impact of the Brexit vote on the support for immigrants to live on own and separate neighbourhoods.

However, the information that the majority is supporting 'Leave' than 'Remain' affected views on other policies. **Participants in the 'Leave' condition were less likely to agree that "the NHS should be free to use for all" ('Leave' 35.2% versus 'Remain' 46.3%).** Also participants in the 'Leave' condition were more likely to agree with the UKIP proposed policy that 'Britain should end multi-lingual formatting of official documents' ('Leave' 25% versus 'Remain' 14.7%).

During the survey, participants were asked to split a bonus of £10 between themselves and another participant. We varied the name of the recipient to be: Henry (UK name), Hans (German name) and Pawel (Polish name), and investigate whether group-biases (confirmed in case of larger donations to Henry and lower donations to Pawel or Hans) were more accentuated in the 'Leave' condition. Our results do not fully corroborate that. The information that the majority voted to 'Leave' led to lower donations in general - both to Henry and to Hans (but not to Pawel). This is more in line with the explanation that people might feel poorer and hence less generous under the thought that the majority support 'Leave'.

Overall, our findings suggest that the population infers information from referenda results that manifests as changes in attitudes. In the Brexit case, we find some evidence that immigrants are viewed in a more negative light. For example, participants in the 'Leave' condition were more likely to agree that "foreign people in the UK who receive state support could get along without it if they tried harder" ('Leave' 39.4% vs 'Remain' 27.3%).

# 1 Introduction

The majority of voters, 52 percent, voted for the United Kingdom to leave the European Union in the 2016 EU referendum. Just after the referendum, a spike in hate crimes was reported in the UK, leading to a common perception that the referendum results unearthed prejudice and empowered misbehaviour towards immigrants (Guardian 2016). The 2016 EU referendum results are not an isolated episode, as there has been a recent rise in extreme right-wing parties in Europe and the election of U.S. President Donald Trump, who advocates for nationalistic and anti-immigration policies. The results reflect, perhaps, the positioning of the constituency on such issues that are only fully revealed by election or Referenda results - both results from the 2016 EU referendum and the 2016 US Presidential Election were unexpected.

This paper aims to understand how the vote of the majority affects individuals' attitudes by focusing on the Brexit-vote. More specifically, we test whether the Brexit vote triggered anti-social attitudes towards immigrants. We conducted a field experiment among 342 participants in the South East of England between November 2017 and April 2018. In our experimental intervention, we manipulated individuals' perceptions about local support for Brexit in a computer-based quiz. We provided truthful information on how the local majority voted, but on *selected* constituencies that were chosen in a seemingly random way by the computer. For one group, the 'Remain' treatment arm, individuals were informed about nearby constituencies whose majority voted to remain in the EU. The 'Leave' group were informed about nearby constituencies whose majority voted to leave the EU. And for a control group, we informed participants about constituencies' demographic and size composition rather than the Referendum results. Individuals generalised the information we gave — that the local majority voted in favour or against the UK to leave the EU - to other places in the country, such as the South of England (which is the region in which 76% of the participant lives). As shown in Figure 1, our intervention was effective in shifting individuals' perceptions of the Brexit-vote. Individuals assigned to the 'Leave' condition guessed that the percentage

of votes to leave the EU was 18 percentage points higher than individuals assigned to the ‘Remain’ condition.

*Figure 1*

We hypothesise that individuals will react to the vote of majority: either to Leave or to Remain in the EU, by inferring population views on immigration. (The Leave campaign advocated anti-immigration issues, and according to the Prime Minister, Theresa May, ending the free movement in the UK is crucial in delivering the Brexit for which people voted in 2016.) We test whether individuals assigned to the ‘Leave’ treatment show more negative attitudes towards immigrants. For the sake of completeness and to understand whether the Remain vote might prevent anti-social behaviour we implemented the ‘Remain’ treatment.

It might have been that the Brexit results empowered people to speak their true opinions, or/and they might have changed individuals’ intrinsic views on immigrants. To exploit these possibilities, we collected data on both intrinsic and extrinsic attitudes. We consider several outcomes: self-reported views about immigrants living in the UK, policy preferences and to more explicitly identify effects on generosity, we conducted a dictator game varying the name of the recipient to be a UK or non-UK name. To measure intrinsic attitudes, we conducted an Implicit Association Test (IAT) – a widely used test in social psychology that is based on unconscious behaviour to measure individuals’ implicit prejudice (Greenwald et. al. 1998).

We find no impacts on individuals’ IAT scores, but detect effects of the experimental interventions on extrinsic attitudes, partly corroborating our hypotheses. These impacts are visible in self-reported preferred policies and in giving outcomes in the dictator game. Individuals assigned to the ‘Leave’ treatment exerted preferences for policies less favourable towards immigrants. This was noticed in a policy index that combines all policy questions asked in the experiment (Anderson 2008). This effect is driven by a higher proportion of participants that were less likely to support free access to public

resources to non-UK citizens (i.e. access to the National Health System, NHS), and were more likely to support the nationalistic policy of ending multi-lingual formatting in official documents (proposed by a UK extreme right-wing party - UKIP - in their 2017 Manifesto). It is worth noting that we do not detect any impact on the demand for more restrictive immigration policies or in support for immigrants to live on their own and in separate neighbourhoods.

Turning to the impact of the Brexit-vote-share itself, perhaps not surprisingly, we observe in OLS regressions a negative correlation between individuals' perceived vote-share to 'Leave the EU' in the region and their views about immigrants' contributions to the UK. This association is likely to be driven by unobservables that correlate with the individuals' own Brexit-votes, as well as that of their social circle, explaining individuals' inferences about the vote preferences of the local majority. We then estimate causal effects of the guessed 'Leave' vote-share using IV regressions. We find that an increase in the perceived Brexit vote-share causes less giving in general - both to UK and non-UK nationals. When the results are decomposed by the name of the recipient, the impacts are especially noticed in donations to Hans (a likely German recipient). The estimates indicate that an increase in the perceived Brexit-vote of 5 percentage points is associated with an increase in the probability of giving an unfair amount to Hans by approximately 11 percentage points.

Our results suggest that voters infer information from election results that manifests as changes in views and behaviour. In the Brexit case, this means that immigrants are viewed in a more negative light. Our explanation is that the information we gave regarding the votes of the majority led individuals to update their beliefs about the populations' preferences. Indeed, we find that the experimental treatments only had significant effects on views about immigrants when the information provided was new and unexpected (i.e. when participants incorrectly answered the map questions).

Our paper contributes to several strands of the literature. More directly, it relates to the literature on Brexit. Such recent work has focused mainly on the determinants of the Brexit-vote (Alabrese et. al. 2018, Becker et. al. 2017) or on the evaluation

of macroeconomic impacts (Sampson 2017, Dhingra et. al. 2017, 2019, Guiso et. al. 2018). To our knowledge, this is the first paper that estimates social impacts of the Brexit-vote using an experimental approach.

It also relates to the literature on randomised information effects on immigrant-related issues. Some of this work investigates the effects of correcting people’s misperceptions around immigration figures (Grigorieff et. al. 2018, Hopkins et. al. 2018) that are very frequently overestimated (Blinder 2015). While Hopkins et. al. do not find statistically significant effects, Grigorieff et. al.’s intervention led to more positive attitudes towards immigrants. Kauffman (2017) finds that the information that an increase in immigration in the long-run would leave the ethnic majority unchanged, leads individuals to exert more positive views towards immigration.

We provided information on referenda results—information that we conjecture has been used to infer the population’s preferences about immigration. In this sense, this paper relates to a body of work on the effects of social interactions on political behaviour (Campos et. al. 2017, Perez-Truglia 2017, Perez-Truglia and Cruces 2019, Gerber et. al. 2008). A key explanation for peer impacts is ‘social image’ - the concern of appearing good to others.<sup>1</sup> It is possible that the election results led to changes in the notion of socially acceptable behaviour - for example, in lowering the stigma for speaking-up against immigrants. Bursztyn et. al. (2018a) test this hypothesis with an online experiment in the U.S. They collected individuals’ willingness to express xenophobic views in public (vs in private) within the days of the 2016 U.S. Presidential Election. They find that after Donald Trump’s victory, there was an increase in the likelihood of participants making public, but not private, donations to an anti-immigration organization.

Our survey was anonymous and participants were told their answers could not be linked to their names. Thus, our experiment was not designed to identify effects driven by social image concerns as in Bursztyn et. al., but on the effect of information on the

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<sup>1</sup>For example, the literature has documented that people increase their chance of voting if they believe their neighbours will learn about their voting participation (Funk 2010, Gerber et. al. 2008) or if individuals anticipate that others will ask about it (DellaVigna et. al. 2017).



vote of the majority.<sup>2</sup> We investigated how the treatment effects interacted with individuals' Brexit votes by running separate regressions for 'Remainers' and 'Brexiters'. We examined whether the information on the Brexit result reinforced an individual's initial views, giving permission to misbehave. This evidence would be consistent with the common view in society that the Brexit-vote unearthed racism and that the 2016 EU Referendum results made some to feel more free to express their true views. Alternatively, we examine whether the election results inhibited individuals' attitudes by putting pressure on individuals to conform to the preference of the majority. Our findings are in line with the latter explanation: Brexiters reacted to information that the majority voted to Remain by expressing preferences to policies more favourable towards immigrants. Remainers, on the other hand, reacted to the information that the majority voted to Leave by becoming more likely express preferences to policies less favourable towards immigrants.

The remainder of the paper is developed as follows. In section 2, we explain the experiment. In section 3, we explain the data, we present the results in section 4, and conclude in section 5.

## 2 The Survey Experiment

### 2.1 Data Collection

We conducted this survey-experiment between November 2017 and April 2018 among the general public in four public libraries in the South East of England, in the towns of Maidstone, Tonbridge and Dartford, in the city of Canterbury, and at the University of Kent, among university students. In total, 342 individuals participated: 255 British and 87 Europeans.

The survey was conducted on laptops using Qualtrics software and individuals had to attend in person to participate. The study was described as 'Citizens' Views on

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<sup>2</sup>Although participants' decisions were private, a change in the notion of socially acceptable behaviour could have also played a role if self-image concerns are in place.

Current Societal Issues’, and participants were informed that they would be quizzed on UK facts, such as the UK’s relationship with other countries and immigration. They learned in the consent form that the survey is anonymous, all information provided is truthful, that the study is conducted by non-partisan researchers,<sup>3</sup> and they were free to withdraw at any point or skip questions. Because of the topic, the survey was administered by English native-speaker assistants.

The survey was advertised via a job-search site, Facebook posts in community groups and participating libraries, tweeted by media and local community groups, via a volunteer-participant mailing lists from the School of Psychology at University of Kent, and with fliers in relevant city centres on the day of the experiment. Participants were paid £10 as a show-up fee, but could earn up to £ 27 for 40-55 minutes of participation. Individuals had to meet the following criteria to participate: be born in the UK or in a European country, live in the UK, be aged between 18 and 80 years old, and feel comfortable in using a laptop keyboard; they were allowed to take the survey only once.

The survey was structured as follows: (i) questions on socio-economic, demographic and political affiliation characteristics and the first implicit association test (IAT); (ii) a UK-fact quiz, in which we varied questions and respective feedback on how the local majority voted in the EU referendum, according to the assigned treatment; (iii) a second IAT, questions to assess the effectiveness of the intervention, a dictator game, and questions on views about immigrants, policies, and a final IAT. In the Appendix, we provided a detailed description of the structure.

Possibly because participants came to our ‘labs’ to take the survey, the attrition rate was low and most completed the entire survey.

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<sup>3</sup>We informed the participants that the researchers were affiliated with the University of Kent in the consent form, but aside from that, there was no other mention that this was a university-related study. We proceed this way because, at that time, there were rumours in society that universities were taking a side and teaching about the adverse possible impacts of Brexit.

## 2.2 The Experimental Intervention

Our aim is to test how individuals react to information that the population living nearby voted for the UK to Leave the EU. We did this by providing truthful information about how the majority voted, but in *selected* areas, with three experimental arms. The fact that 52% of the population voted to leave the EU is widely known. This study uses the fact that less is known about regional votes, and that nearby areas' support for Brexit are potentially more influential on individual attitudes than national support.

For the 'Leave' group, we always informed participants about the vote of the majority for areas where the majority voted to Leave. For the 'Remain' group, we repeatedly informed participants of vote results in areas where the majority voted to Remain. For the 'Control' group, we informed participants about the area's demographic composition. Since our goal was to evaluate the impacts of the referendum results, we stressed that the information we provided was impartial: we informed participants that we are not partisan and that all information we provide is true.

Our intervention ran as follows. We conducted a seven-question quiz. Participants were paid £1 per correct answer, and they were informed of their accuracy immediately after they responded to each question. The first two questions were the same for all participants, while the remaining questions varied depending on the assigned experimental condition: 'Control', 'Leave' or 'Remain'. The third, a four-choice question, was designed to prime Brexit for participants assigned to the two latter conditions. They were asked 'When is the UK scheduled to leave the European Union?', while individuals in the control group were asked 'How many times has London hosted the Olympic Games?'

The remaining questions were meant to inform participants about how the majority voted in local constituencies. We used animated maps of the UK in which constituencies were seemingly randomly chosen by the computer. We did not provide any explanation as to how the computer selected these places, we only told participants to wait until an area was selected. For participants in the 'Leave' or in the 'Remain' treatments, the

fourth question was: ‘How did the majority of voters in (constituency X) vote in the 2016 EU referendum?’, with two possible alternatives: ‘The majority voted to LEAVE the EU’ and ‘The majority voted to REMAIN in the EU’. The fifth question, after another seemingly random draw of constituency by the computer, was again: ‘How did the majority of voters in (constituency Y) vote in the 2016 EU referendum?’ The next question was, for the third time, after the computer selected another constituency: ‘How did the majority of voters in (constituency W) vote in the 2016 EU referendum?’

The X, Y, W constituencies in the ‘Remain’ condition were Norwich South, Tunbridge Wells, and Winchester, where the majority voted to remain in the EU. In the ‘Leave’ condition, these constituencies were, respectively, Mid Norfolk, Sevenoaks and Gosport, whose majority voted to Leave the EU.<sup>4</sup> All of these places are in the East of England (where 85% of participants live), and constituencies Y and W are in the South East (where 76% live). The ‘Control’ group was exposed to the same animated UK maps, but the fourth through sixth questions were instead: ‘Is the majority of the population in the constituency of (constituency X,Y,W) male or female?’<sup>5</sup>

The last question asked participants to guess a vote-share, and individuals were paid £1 if their answer was within two percentage points of the correct answer. Participants in the ‘Remain’ (‘Leave’) treatment were asked ‘Out of every 100 voters in the constituency W, how many of them do you think voted for the UK to remain in (to leave) the EU in the 2016 Referendum?’ In Winchester (shown in the ‘Remain’ treatment), 60.3% voted to Remain, and in Gosport (shown in the ‘Leave’ treatment), the percentage of Leave votes was 62%. The facts provided above reinforced what was told in the previous questions: that the local majority voted in favour of or against Brexit, according to the assigned treatment. For the control group, the last question was ‘Out of every 100 people living in the South East of England, how many of them do you think live in (constituency W)?’

In summary, individuals assigned to the ‘Remain’ condition learned that, among

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<sup>4</sup>We used results at the constituency level, as estimated by Hanretty (2017).

<sup>5</sup>For 50% of the participants, the X, Y, W constituencies were Norwich South, Tunbridge Wells, and Winchester. For the other half, Mid Norfolk, Sevenoaks and Gosport were selected.

three seemingly randomly selected constituencies, the majority voted to remain in the EU. Those assigned to the ‘Leave’ treatment consistently learned that the majority voted to leave the EU. The control group was not informed about others’ votes and hence, we have no reason to believe their perceptions on the support for Brexit were affected.

After the quiz, we asked participants to give their best guess on the proportion that voted to leave the EU in several places. Table 1 shows averages across treatment groups for all asked locations. Respondents assigned to the ‘Leave’ condition guessed a significantly higher Brexit vote-share, between 16 to 20 percentage points, than those in the ‘Remain’ condition. Individuals assigned to the control group that were not provided any information on others’ vote had intermediate guesses, on average closer to the actual Brexit-vote share, as shown in column 4.

*Table 1*

## **3 Data**

### **3.1 Outcomes**

We examine the impacts on implicit and explicit measures of discrimination, categorized into four groups of outcomes: (i) Implicit Association Test scores, (ii) views on immigrants; (iii) views on policies; and (iv) giving in a dictator game. We investigate the impacts on views and preferred policies (in items (ii) and (iii)) using several survey questions. We also aggregated these questions, per category, in a summary index, following the methodology in Anderson (2008). The indexes were created in such a way that higher values indicate more negative attitudes towards immigrants.

### 3.1.1 Implicit Association Test

We assessed implicit attitudes towards British and non-British nationals by applying the Implicit Association Test (IAT) developed by (Greenwald et. al., 1998). This psychological test is a computer-based double-characterisation task that has been utilised extensively to study racial prejudice in Social Psychology (Oswald 2013, Pérez 2010, Todd and Burgmer 2013) and in Economics (Beaman et. al. 2009, Rooth 2010, Charles and Guryan 2008, Bertrand and Duflo 2016).

Our test intended to measure the strength of respondents' association between UK and non-UK names with positive and negative concepts by comparing the fluency (measured in reaction time) with which the individual matched in-group or out-of-group names, such as Henry or Hans, with words that carry a positive or negative meaning, such as peace or anger.<sup>6</sup> The idea is that the faster one assigns the name to a category (positive or negative), the easier is the characterization, and hence, the stronger is the association. The IAT result we use is the D-measure (Greenwald et. al. 2003). Within this measure, an increase (decrease) in reaction times to match non-UK names with unpleasant (pleasant) words indicates implicit prejudice towards non-UK individuals. Higher values of the IAT indicate stronger implicit prejudice towards non-UK individuals.

We conducted the IAT three times over the survey. The first time was before the intervention to measure participants' pre-determined implicit views. The second time was just after the quiz to isolate the effect of the Brexit vote-share information itself, and lastly, by the end of the survey, after participants might have acted on the vote-information, that could have changed them. It is worth mentioning that the IAT is used in studies using priming interventions, indicating that this measure is somewhat

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<sup>6</sup>Participants were asked to pair UK/non-UK names with positive/negative attributes as rapidly as possible by sorting a series of UK/non-UK names and good and bad adjectives (that appear in the middle of the screen) into left or right columns with the move of two fingers. The left and right columns sometimes are explained respectively as UK/pleasant and non-UK/unpleasant, and later as UK/unpleasant and non-UK/pleasant. Each of our IAT consisted of seven phases, including learning phases to familiarise participants with the material and rules. A detailed explanation of the seven phases (for a general IAT) is explained in Lane (2007).

malleable (Webb et. al. 2012, Todd and Burgmer 2013).

### **3.1.2 Views on Immigrants**

On a 5-point scale, we asked the extent to which participants agree with the following statements: ‘The South East of England is made a better place by people coming to live in the UK from Europe’ and ‘London is made a better place by people coming to live in the UK from Europe’. We also asked ‘Most people who come to live in the South East of England pay taxes. They also use health and welfare services. On balance, do you think Europeans who come to the South East of England take out more than they put in, or put in more than they take out?’. The answers varied in a 5-point scale from ‘Take out much more than they put in’ to ‘Put in much more than they take out’. We repeated this question, asking instead about people that come to live in London. The remaining two questions were, on a 5-point scale, the extent to which the participant agrees with the following statements: ‘Most foreign people living here who receive support from the state could get along without it if they tried’ and ‘It makes sense for foreign people to live in their own neighbourhoods because they share more and get along better than they would if they mixed with British people’. We then created separate indicators for whether the participant agrees with each individual statement, and we use those as main outcome variables. Following Anderson (2008), we created a summary index by averaging individuals’ answers.<sup>7</sup>

### **3.1.3 Views on Policy**

To assess attitudes about immigration, participants were asked, using a 5-point scale, the extent to which they agree with the establishment of targets to reduce immigration, quotas for non-Europeans and quotas for Europeans to settle in the UK, in three separate questions.

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<sup>7</sup>We also experimented in creating the index, excluding the last two questions and focusing only on questions that explicitly ask about the perceived contribution of immigrants to the UK. The results for this index are largely the same as the one including all questions.

We asked what Britain’s long-term policy should be using the same wording as in the British Social Attitudes Survey. This is a 5-choice question varying along the scale of complete integration to separation from Europe, including options such as ‘Work for the formation of a single European government’ to ‘Leave the European Union’.<sup>8</sup> We created an indicator for whether the participant answered that the UK should leave the European Union.

Related to access to public resources, we asked whether non-UK citizens living in the UK should pay a charge for their use of the NHS,<sup>9</sup> and we created an indicator for whether the respondent answered that the NHS should be free for all those living in the UK.

Lastly, we considered a nationalistic proposal by a right-wing party, the UK Independence Party (UKIP), in their 2017 Manifesto. We asked the extent to which, on a 5-point scale, they agree with the statement that ‘Britain should implement the end of multi-lingual formatting on official documents. Official documents should be published only in English and, where appropriate, Welsh and Gaelic’.

### 3.1.4 Giving

The measure of generosity is the amount of money that the individual allocates to another participant. During the survey, half of the sample, and always a British national, were asked to split £10 among themselves and an anonymous paired participant. We intended to test how individuals’ generosity varies towards UK and non-UK recipients. We assigned a hypothetical name to the recipient participant, that could have been:

- (i) Henry, a UK name;
- (ii) Hans, a non-UK name from a high-income country (Germany)
- (iii) Pawel, a non-UK name from a low-income country (Poland)

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<sup>8</sup>The remaining and intermediate alternatives were: Stay in the EU but reduce its power, Leave things as they are, and Stay in EU and increase its powers.

<sup>9</sup>Participants chose from three possible alternatives: (i) Yes, definitely; (ii) Yes, non-UK citizens should pay a charge, unless they are paying taxes in the UK; and (iii) No, the NHS should be free for all those living in the UK.



All participants (donors and recipients) were paid in cash at the end of the survey, in accordance with the donor’s decision. The specific wording for the task was:

You have been paired with another survey participant. He or she is a real person, who also lives in the UK. We will refer to this person as (name). Your team — yourself and (name) — have been selected to receive an additional payment of £10 for your joint participation in this survey. However, you will be the one to decide how to split the £10 between yourself and (name).

The majority of participants (73.5%) gave £5 — the fairest allocation.<sup>10</sup> As a measure of anti-social behavior, we examine both the amount given and whether the amount given was less than £5.

## 3.2 Descriptive

In total, 342 individuals participated, comprising 169 members of the general public and 173 university students, as shown in Table 2. The sample has a majority of British nationals, females, and individuals that are younger than 25.

There are significant differences between British (75%) and Europeans (25%) that answered the survey. Most of the British participants are from the general public (62%),<sup>11</sup> with a larger participation rate amongst the older population (50% are older than 25, and 22% are older than 55). They are politically engaged: 81% voted in the 2017 general election and 70.7% feel close to a political party. Among Europeans, 87.4% are university students, 82.6% are younger than 25, only 14% voted in the last

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<sup>10</sup>In a meta-study of dictator games, Engel (2011) documents that dictators most frequently donate less than half of the endowment. We believe that the framing used in our explanation for the endowment — a bonus for joint participation — was suggestive, affecting the decision of donating £5. In the Appendix, we provide a histogram for the amount donated.

<sup>11</sup>Among British participants, there are differences between respondents from the general-public and university students. The former are older, which is reflected in other socio-economic differences such as marital status and labour-force participation. These groups have similar turnout-rates and party preference, except that university students are more likely to exert a preference for the labour party (47.4% vs 31.4%).

UK election, and 43.5% are close to a political party. On average, they have been in the UK for 5.5 years.

*Table 2*

In Table A1 in the Appendix, we show the summary statistics for all outcomes. Among the control group, 23.2% of individuals stated that the UK should leave the EU in the long-run (this proportion was 29.7% for participants that are British nationals). This fraction is lower than in the British Social Survey (41% in 2016), suggesting that the sample used in this study has a larger participation of Remainers than the UK population.

### **3.2.1 Experimental Design and Randomization**

Table 3 provides the number of participants by treatment. For dictators, the quiz intervention is interacted with the recipient hypothetical name, generating nine conditions. The recipient, on the other hand, only faced three quiz conditions.<sup>12</sup>

*Table 3*

The randomization was conducted by the Qualtrics software. Most characteristics do not predict assignment to the quiz treatment: averages are similar across the three conditions. Out of 45 pairwise mean comparisons, only 4 have a p-value less than 0.10. The significant differences indicate that the sample in the control group is less likely to indicate a preference for the labour party and is more likely to be composed of married individuals. In the main regression, we include covariates for party preference and demographics to increase precision and to control for any differences between conditions

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<sup>12</sup>As explained above, all donors were British, and the paired-recipient was British or European, resulting in a one-to-one pairing between donors and recipients. In Table A2 in the Appendix, we decompose Table 3 by nationality.

in observable characteristics.

## 4 Results

### 4.1 Treatment Effects

We examine treatment effects visually (in Figures 2-4) and in a regression analysis. In the latter, we estimate equation (1), in which  $Leave_i$  and  $Remain_i$  are indicators for the respective treatments that individual  $i$  is assigned to.  $\mathbf{X}_i$  is a vector of covariates including gender, age, marital status, British nationality, eleven political party preference indicators and a dummy for whether the respondent was recruited from the general public,<sup>13</sup> and  $\varepsilon_i$  is a random disturbance term. Robust standard errors are clustered at the level of day–place the survey was conducted.

$$outcome_i = \alpha + \gamma Leave_i + \delta Remain_i + \theta \mathbf{X}_i + \varepsilon_i \quad (1)$$

The estimated coefficients in (1) are impacts, measured as the difference in average outcomes with respect to the control group. To test for different impacts between the ‘Leave’ and ‘Remain’ treatments, we report the p-value for a two-tailed equality test between  $\gamma$  and  $\delta$ .

#### 4.1.1 Effects of Treatments on Intrinsic Prejudice and Views about Immigrants

Table 4, Panel A, shows the estimated treatment impacts on IAT scores, also visible at the top of Figure 2. Each column represents estimates for a separate regression. Odd columns show results for the baseline specification, and even columns include a covariate for the pre-determined IAT. For the most complete specification, the estimated impacts on the IATs are not statistically significant with high p-values, suggesting a null effect

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<sup>13</sup>We also run regressions including covariates for IAT pre-determined score and p-values for the estimated impacts do not increase. These results are not described in the paper, but available under request.

of the treatments (of the knowledge on the vote of the majority to Leave the EU) on intrinsic attitudes towards immigrants.

We now turn to impacts on extrinsic attitudes in terms of self-reported views. The pattern observed in Figure 2 is consistent with our hypotheses: the unconditional averages suggest that negative views are more frequent among individuals assigned to the ‘Leave’ condition than to the ‘Control’ than to the ‘Remain’ treatment. The only exception is the proportion that agrees that ‘Foreign people should live in their own neighbourhood’, in which a higher (but not statistically significant) average is observed for the control group.

Table 4, Panels B and C, report the estimated treatment impacts controlling for covariates. The differences are only marginally statistically significant between the ‘Leave’ and ‘Remain’ treatments, and for the likelihood of agreeing that ‘Foreign people could get along without support if they tried harder’ (p-value=0.070) and ‘Europeans who come to London take out more than they put in’ (p-value=0.052).

*Table 4*

#### **4.1.2 Effects of Treatments on Views about Policies**

Turning to the impact on views on policies, illustrated in Figure 3 and Table 5, we find mixed results. There is no statistically significant evidence that treatment affects views about immigration policies (i.e. establishment of quotas for settlement or target to reduce immigration). On the other hand, significant effects are detected on views associated with the restriction of access to public resources and with respect to the nationalistic policy. Individuals assigned to the ‘Leave’ treatment are 10.5 percentage points (p.p.) less likely to state that the ‘NHS should be free’ for all than individuals in the control or in the ‘Remain’ treatment (p-value  $\leq 0.051$ ). Those in the ‘Leave’ treatment are 9 p.p. more likely to agree with putting an end to multi-lingual official documentation than individuals assigned to the ‘Remain’ treatment. Overall, a higher policy index, indicating preferences for harsher policies towards immigrants, is observed

in the ‘Leave’ than in the ‘Remain’ condition (p-value=0.017). The estimated policy-index difference between these conditions is of the order of 0.15, or 0.20 standard deviations of this variable in the sample.

*Table 5*

### **4.1.3 Effects of Treatments on Giving**

Figure 4 shows that the average amount given was practically the same in the ‘Remain’ and ‘Control’ conditions (4.48 vs 4.47), while the average amount given was 10% lower in the ‘Leave’ condition (4.01). This difference is also noticeable in the proportion of respondents that gave less than half of the endowment: 30.4% in the ‘Leave’ condition as opposed to 18.9% in the ‘Remain’ group. However, there are only marginally statistically significant differences across these treatments (Table 6, columns 1 and 2).

In Table 6, columns 3-9, we examine separately the donated amount by recipients’ name. The results indicate that a lower amount of giving in the ‘Leave’ than in the ‘Remain’ condition occurs both when the name of the recipient is British (Henry) and non-British (Hans), suggesting that the ‘Leave’ condition might have led to less generosity even towards in-groups. It is worth noting, however, that the differences between ‘Leave’ and ‘Remain’ are more striking and statistically significant at the 1% level, when the name of the recipient is Hans (column 7). When the recipient name is Pawel — a Polish name — there are no noticeable differences in amount given across conditions (column 5), but individuals are more likely to donate an unfair amount in the ‘Remain’ treatment (column 9).

Overall, the impacts of the ‘Leave’ treatment on generosity might be driven by explanations other than group biases. For example, it might be that individuals feel poorer when thinking about Brexit, donating less for the more well-off in society (Henry and Hans), but not for the less affluent (Pawel).

*Table 6*  
18

In the Appendix, we further investigate whether the treatments have caused some outgroup bias by examining donations to Hans and Pawel, *with respect to Henry*. We conducted difference-in-difference regressions by interacting treatments with recipients’ names. The significant results indicate a perhaps surprising effect — that individuals become less generous towards Pawel under the information that the majority voted to Remain.<sup>14</sup> Participants acted as if driven by some inequality aversion, penalising the less affluent (Pawel) with respect to the more affluent (Henry or Hans) in the ‘Remain’ condition, and acted the other way round in the ‘Leave’ treatment (Figure 4, Table 3).

## 4.2 Effects of the Brexit Vote

The statistically significant differences were noticed mostly in comparisons between ‘Remain’ vs ‘Leave’ treatments. In general, because the impacts are in different directions, suggesting that the perceived support for Brexit itself - as evidenced by election outcomes - affects group perceptions and attitudes in a monotonic way. Next, we examine the effect of the guessed Brexit-vote using an instrumental variable approach.

In Table 7, we examine the effect of the perceived Brexit-vote in the South East of England for the main outcomes.<sup>15</sup> Each entry represents a coefficient for a separate regression. Column 1 presents the estimated coefficient for the endogenous variable—the guess for the proportion that voted for the UK to leave the EU in the South East of England — in an OLS regression. Column 2 shows the estimated causal effects in an IV regression, in which the guessed vote-share is instrumented by the experimental treatment conditions. The estimates for the first stage regression, where the ‘Leave’ vote guesses are explained by the experimental treatments, are shown in Table A4 in the Appendix. They mirror the findings reported in Table 1, and confirm the strength

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<sup>14</sup>In Table A3 in the Appendix, we show results for two main equations to identify effect, using as baseline for comparison donations to Henry in the control condition. In Columns 1-2, we estimate the equation:  $outcome_i = \alpha_1 + \gamma_1 Leave_i + \delta_1 Remain_i + \pi_1 Henry + \gamma_{11} Leave_i \cdot Hans + \delta_{11} Remain_i \cdot Hans + \theta \mathbf{X}_i + \varepsilon_{1i}$ , including donations for Hans or Henry. In Columns 3-4, we estimate the equation:  $outcome_i = \alpha_2 + \gamma_2 Leave_i + \delta_2 Remain_i + \pi_2 Henry + \gamma_{22} Leave_i \cdot Pawel + \delta_{22} Remain_i \cdot Pawel + \theta \mathbf{X}_i + \varepsilon_{2i}$ , including donations for Pawel or Henry.

<sup>15</sup>We replicate results for all outcomes in Table A5 in the Appendix.

of the instrument with an F-statistic of 38 for this regression.

The OLS results are reported in Column 1. They indicate a positive correlation between the size of the perceived Brexit vote in the region and indexes (i.e. more negative attitudes towards immigrants, the larger the perceived support to Leave in the region). This correlation is likely to be driven by an individual’s own vote, as well as by their social circle and media outlets through which individuals form perceptions about the vote of the local majority. However, there is no significant correlation between the vote guesses and any of the generosity measures or IAT scores.

In column 2, we report the IV estimates. They indicate that the perception of a larger share of Brexit supporters causes an increase in individuals’ policy index (row 2) and has a negative impact on generosity, as measured by the amount given and by the likelihood of giving an unfair amount. These last estimates (rows 6 and 7) are only marginally statistically significant at the 10% level. The impact of the perceived vote share is larger and statistically significant when the giving is towards a European recipient — Hans — as indicated in row 11. The IV estimates indicate that an increase of 10 percentage points in the perceived Brexit vote share in the south east causes an increase in the likelihood of individuals making an unfair donation (of less than £5) to Hans by 21.8 percentage points.

*Table 7*

### **4.3 Heterogeneous Effects**

We have shown evidence that information on Referenda results impacts individuals’ attitudes in the case of the Brexit vote. We examine heterogeneous effects to better understand the impacts.

First, we decompose the data based on individuals’ performance on the map quiz to verify our underlying hypothesis that the treatment impacts are driven by ‘learning’. We divided the sample by (a proxy for) whether the information provided was ‘expected’

or ‘unexpected’ and novel. In the first group are individuals who scored 2 or 3 correct answers (out of 3), and in the latter are those who scored 0 or 1 correct answer (out of 3). To control for pre-determined knowledge on politics, we consider the baseline specification and include the score in the first two questions in the quiz (that are the same for all treatments). The results are reported in Table 8, Panel A.

No significant treatment effects are detected for the group that answered most of the questions correctly. By contrast, there are significant impacts for individuals who were provided new information (those that responded incorrectly to the majority of quiz questions), and the coefficients for these impacts are larger. Among the sample that learned more about the Brexit results from the intervention, individuals assigned to the ‘Leave’ condition have shown more negative views towards immigrants (column 2), both with respect to the control (p-value=0.026) and the ‘Remain’ treatment (p-value=0.001). This finding is consistent with the view that the population updated their views about the contribution of immigrants based on their knowledge of the vote of the majority.

Next, we split the sample by individuals’ characteristics that predict their own predisposition to vote for leave, and classified individuals as ‘likely Pro-Remain’ or ‘likely Pro-Leave’. To avoid general priming of Brexit, contamination across treatments, or suspicions about the aim of this study, we did not ask participants their voting choice on the EU referendum. Instead, we took as indicative of their vote their views about the long-run relationship between the UK and Europe (as the reader might recall, this was asked after the experimental intervention). To classify individuals, we run an OLS regression explaining whether a participant answered that the future relationship of the UK with the EU should be ‘Leave the European Union’ or ‘Stay in the EU, but reduce its powers’, represented in the indicator ‘Less EU’.<sup>16</sup> We consider only individuals in the control group. As explanatory variables, we use British-nationality and party-preference indicators. The regression results are reported in Table A6 in the

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<sup>16</sup>We used this specific cut-off, as it is commonly used by the British Social Survey to proxy for the approval for Brexit and is highly correlated with the Brexit vote.



Appendix.<sup>17</sup>

Using the estimated coefficients from this regression, we predicted this probability for all. We then classified as ‘likely Pro-Leave’, individuals whose predicted probability is above the average predicted by the model, and ‘likely Pro-Remain’, all others.<sup>18</sup> The regression results split by this classification are shown in Table 8, Panel B.<sup>19</sup> The significant coefficients are detected for the policy index for both groups. Likely Remainers assigned to the ‘Leave’ condition have a higher policy index than the control group. However, there is no impact of the ‘Remain’ treatment for ‘Remainers’ (column 2). On the other hand, for likely Brexiteers (column 7), the impactful treatment is the ‘Remain’ condition, in which individuals responded more favourably to policies towards immigrants. For both groups - Remainers and Brexiteers - it seems that it is the notion that the majority voted in a *different* way that makes individuals change their attitudes. It is interesting to note that no impact on the IAT score was detected for any group, indicating that, at least in the short-run, the Brexit vote did not change their intrinsic views towards immigrants, only their extrinsic attitudes, in a way that constraints individuals’ behaviour.

Table 8

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<sup>17</sup>Consistent with the British Social Attitudes Survey, British nationals and individuals with preferences towards right-wing parties are significantly more likely to choose the ‘Less EU’ option.

<sup>18</sup>Following this procedure, individuals classified as ‘Pro-Leave’ are British nationals who asserted a preference for the Cooperative Party, Conservative Party, or UK Independence Party, or that stated No Party Preference, as well as European nationals who asserted preference for the Conservative Party, the UK Independence Party, or Other Party. Individuals classified as likely ‘Pro-Remain’ are British nationals who asserted a preference for the Green Party, Labour Party, Liberal Democrats Party, Plaid Cymru or stated ‘I don’t know’ or ‘I prefer not to say’, and all other European nationals.

<sup>19</sup>We replicated the regressions using other classifications for ‘Likely Pro-Remain’ and ‘Likely Pro-Leave’ based on the answer itself about the UK’s relationship with the EU. We find similar qualitative results. These are available under request.

## 5 Conclusion

The result of the 2016 EU referendum - leading to a divorce between the UK and the EU - is likely to affect millions of immigrants in the country. We conducted a field experiment in England to understand how the local (perceived) support for Brexit - as revealed by Referenda results - affects intrinsic and extrinsic attitudes towards immigrants in the UK. To our knowledge, this is the first paper that investigates the social effects of the Brexit vote. It also contributes to emerging literature on how election or Referenda results affect individuals' behaviour (Bursztyn et. al. 2018a,b).

Although we find no effects on Implicit Association Test scores, we detected significant impacts of the Brexit vote share on individuals' reported preferences on policies related to immigrants living in the UK. Our findings suggest that Referenda results might shape norms and, in the Brexit case, affect attitudes in society. The results indicate that individuals change their self-reported views in order to conform to the voice of the local majority.<sup>20</sup>

Most of the significant differences are detected in average comparisons between 'Leave' and 'Remain' treatments, rather than in pairwise comparisons with 'Control'; with 'Leave' and 'Remain' conditions leading to a change in attitudes on opposite directions. The 2016 Referendum results were close (52% vs. 48%), but there is plenty of heterogeneity in the Brexit vote. An implication of our results is that pre-existent regional differences in the support to 'Leave' or 'Remain' - and on the different views on policy issues campaigned for on each side - might be exacerbated after the local referenda results are announced.

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<sup>20</sup>These findings somewhat resonate with those in Perez-Truglia and Cruces (forthcoming). They conducted a field experiment in the U.S., providing information on neighbours' campaign contributions. They find that individuals' contributions are positively affected by neighbours' contributions, indicating that people react to information about the behaviour of others. This paper investigates a more distant source of influence — the information about the vote of the local majority, rather than neighbours.

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Figure 1 - Effect of the Experimental Intervention on Individuals' Perceptions

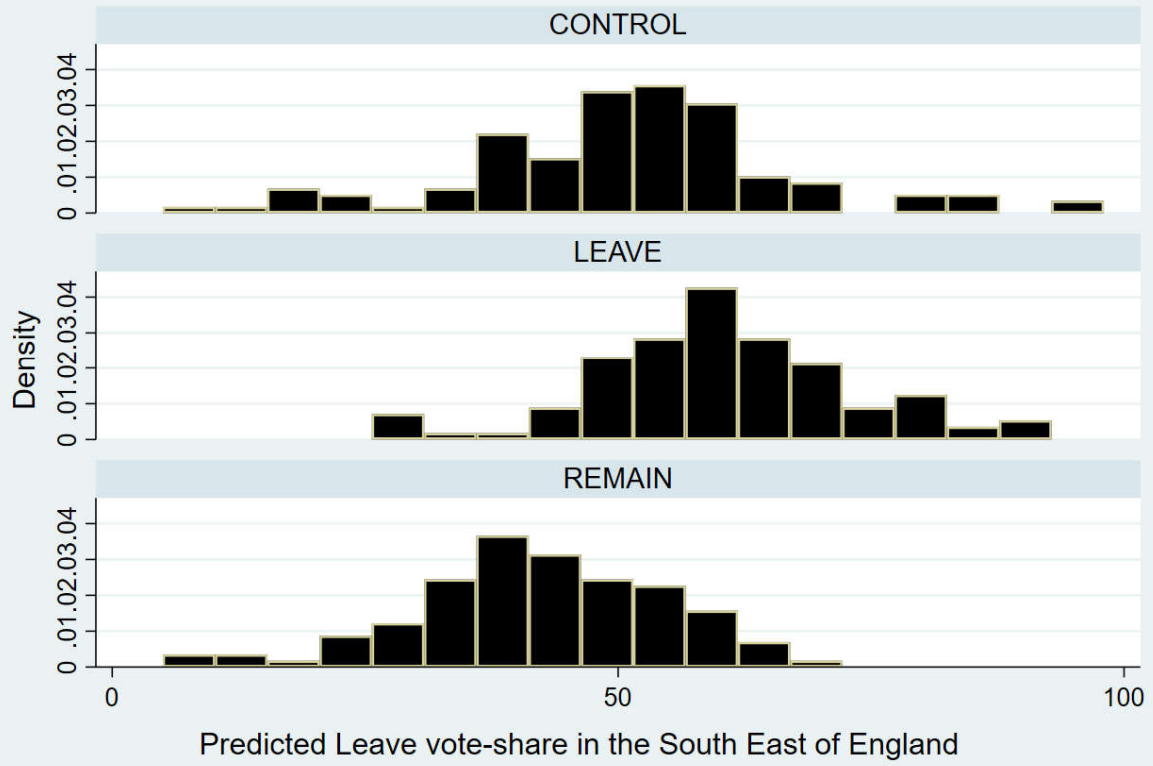
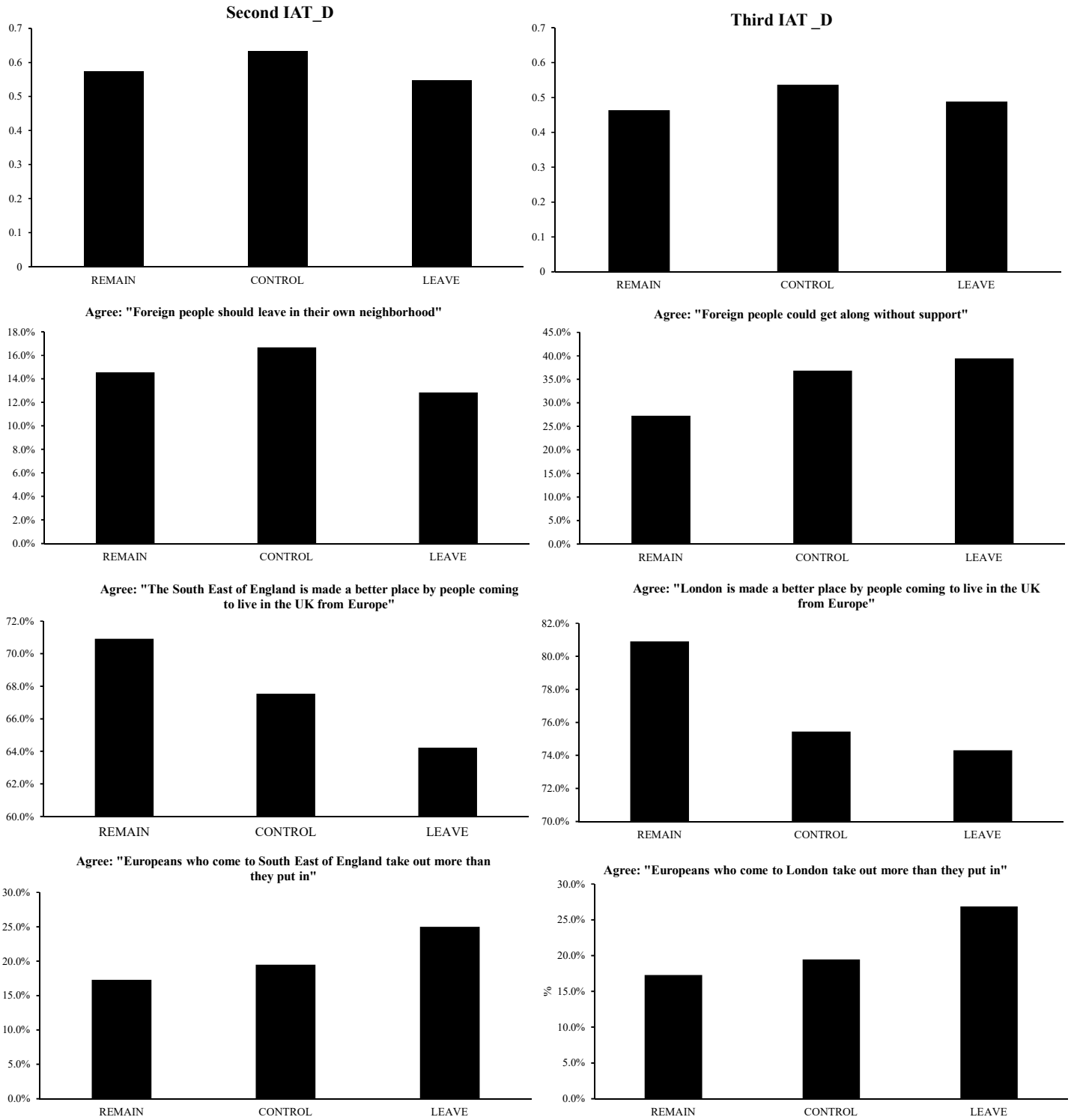
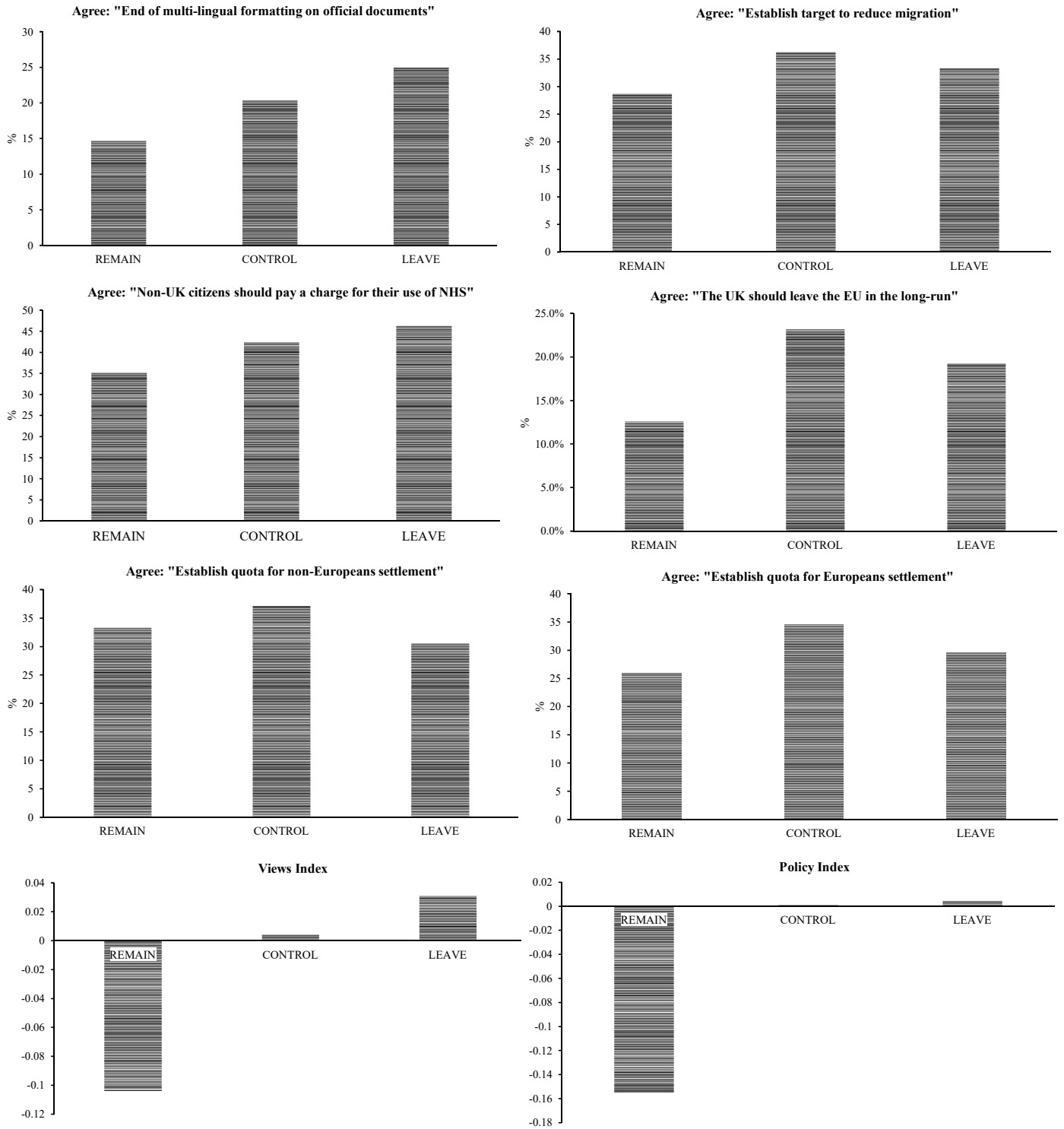


Figure 2

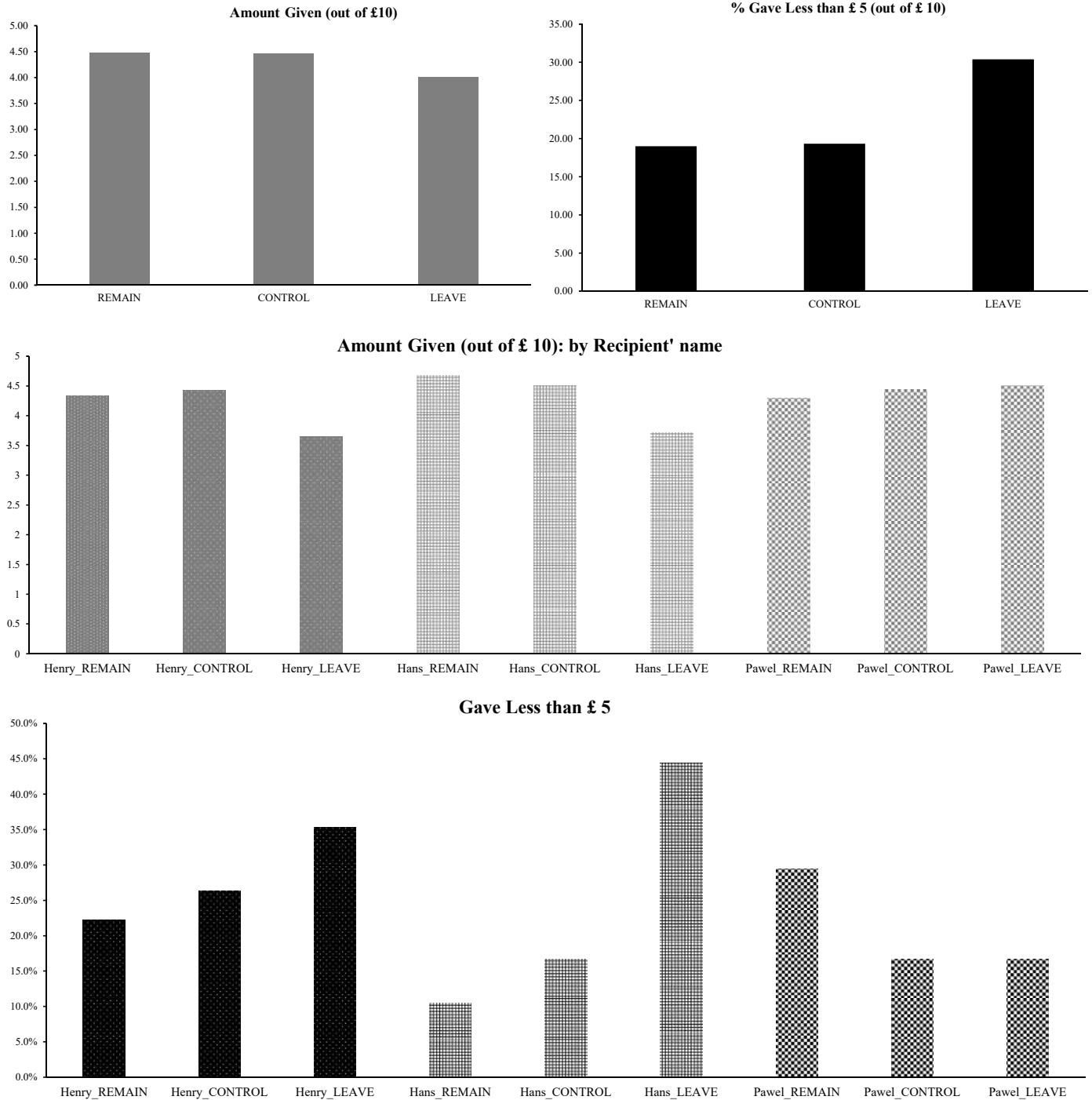




**Figure 3**



**Figure 4**



**Table 1 - Participants' Prediction of vote-share to 'LEAVE the EU'**

	Experimental Condition			[ II ] - [ I ]	Actual 'leave' vote-share
	REMAIN	CONTROL	LEAVE		
	[ I ]	[ II ]	[ III ]		
South East of England	42.62	51.60	60.47	17.85	51.77
London	35.87	43.52	52.47	16.60	40.06
Tunbridge Wells	39.05	54.30	59.11	20.06	45.11
Sevenoaks	45.05	54.75	61.24	16.18	54.38
n	115	116	116		

**Table 2 - Averages**

	All	By nationality	
		British	Europeans
British	74.6%		
Female	61.1%	58.9%	67.4%
< 24 years old	58.7%	50.6%	82.6%
25-54 years old	23.9%	27.3%	14.0%
> 55 years old	17.4%	22.1%	3.5%
Married	18.0%	21.7%	7.0%
Living with children	13.9%	17.0%	4.7%
University degree	53.0%	45.1%	80.0%
employed (full+half time)	19.2%	23.3%	7.0%
unemployed	8.0%	9.9%	2.3%
voted last election	64.0%	81.0%	14.0%
Close to political party	64.4%	70.7%	43.5%
Labour Party preference	32.4%	37.5%	17.4%
% Leave-vote in own constituency	49.6%	50.7%	46.6%
General public sample	49.4%	62.0%	12.6%
n	342	255	87

**Table 3 - Number of Observations by Treatment**

	Dictator - giving to:			Recipient (d)	All (a)-(d)
	Henry (a)	Hans (b)	Pawel (c)		
Remain	20	19	19	56	114
Control	17	19	20	58	114
Leave	19	19	19	57	114
Total	56	57	58	171	342

**Table 4 - Effects of Treatments on Views about Immigrants**

<i>Panel A</i>				
	Second IAT_D		Third IAT_D	
Control mean	0.63	0.63	0.54	0.54
Leave	-0.0666 [0.0810]	-0.0618 [0.0640]	-0.0405 [0.0387]	-0.0322 [0.0332]
Remain	-0.0494 [0.0310]	-0.0175 [0.0275]	-0.0688 [0.0373]*	-0.0421 [0.0332]
p-value (Remain=Leave)	81.9%	40.9%	55.2%	73.6%
control for pre-determined IAT_D	No	Yes	No	Yes
Observations	254	253	282	280
<i>Panel B</i>				
	The South East is made a better place by Europeans	London is made a better place by Europeans	Europeans who come to... South East take out more than they put in	London take out more than they put in
Control mean	0.68	0.75	0.19	0.19
Leave	-0.0317 [0.0525]	-0.0374 [0.0542]	0.0686 [0.0555]	0.0870 [0.0549]
Remain	0.0074 [0.0331]	0.0080 [0.0441]	0.0020 [0.0694]	-0.0072 [0.0606]
p-value (Remain=Leave)	36.5%	34.3%	24.5%	5.2%
Observations	331	331	329	329
<i>Panel C</i>				
	Foreign people... should live in their own neighborhood		Views Index	
Control mean	0.17	0.37	0.00	
Leave	-0.0457 [0.0432]	0.0589 [0.0552]	0.0557 [0.0576]	
Remain	-0.0316 [0.0344]	-0.0623 [0.0719]	-0.0642 [0.0772]	
p-value (Remain=Leave)	80.9%	7.0%	0.1420	
Observations	331	331	329	

Notes: The second IAT\_D refers to the score of the IAT administrated just after the experimental intervention. The Third IAT\_D refers to the IAT administrated by the end of the survey. Each column in Each Panel presents estimates for a separate regression. All regressions include covariates for gender, marital status, political party preference indicators and dummies for whether the participant is British and if the participant was recruited from the general public. Robust standard errors are clustered at the session-day level.

\*\* Statistically significant at the 5% level, \* Statistically significant at the 10% level

**Table 5 - Effects of Treatments on Preferred Policies**

	Target to reduce immigration	Quota for non-European settlement	Quota for European settlement	UK should leave the EU in the long run	End of multi-lingual official documents	Free NHS for all	Policy Index
Control mean	0.36	0.37	0.35	0.23	0.20	0.42	0.00
Leave	0.0219 [0.0608]	-0.0322 [0.0555]	-0.0192 [0.0597]	-0.0192 [0.0571]	0.0902 [0.0615]	-0.1050 [0.0421]**	0.0750 [0.0900]
Remain	-0.0213 [0.0804]	-0.0102 [0.0624]	-0.0501 [0.0607]	-0.0813 [0.0487]	-0.0031 [0.0542]	0.0068 [0.0697]	-0.0758 [0.0914]
p-value (Remain=Leave)	41.9%	52.7%	54.0%	19.5%	2.9%	5.1%	1.7%
n	327	327	327	317	328	327	317

Notes: Each column presents estimates for a separate regression. All regressions include covariates for gender, marital status, political party preference indicators and dummies for whether the participant is British and if the participant was recruited from the general public. Robust standard errors are clustered at the session-day level.

\*\* Statistically significant at the 5% level, \* Statistically significant at the 10% level

**Table 6 - Effects of Treatments on Giving**

	Amount given	Gave less than £ 5	Amount given to			Gave less than £ 5 to		
	[ 1 ]	[ 2 ]	Henry [ 3 ]	Hans [ 4 ]	Pawel [ 5 ]	Henry [ 6 ]	Hans [ 7 ]	Pawel [ 9 ]
Control mean	4.47	0.19	4.42	4.53	4.47	0.26	0.16	0.16
Leave	-0.2537 [0.4057]	0.0646 [0.0604]	-0.4127 [0.5506]	-0.1732 [1.0433]	0.1979 [0.5497]	-0.0053 [0.1031]	0.2287 [0.1595]	0.0046 [0.1034]
Remain	0.1836 [0.3943]	-0.0618 [0.0678]	0.7301 [0.9186]	0.6752 [0.6752]	-0.5713 [0.7408]	-0.2761 [0.1558]	-0.1030 [0.1780]	0.1621 [0.0675]**
p-value (Remain=Leave)	15.2%	10.3%	7.9%	11.2%	35.4%	10.0%	0.9%	29.7%
Covariates	yes	yes	yes	yes	yes	yes	yes	yes
n	171	171	56	57	58	56	57	58

Notes: Each column presents estimates for a separate regression. All regressions include covariates for gender, marital status, political party preference indicators and dummies for whether the participant was recruited from the general public. Robust standard errors are clustered at the session-day level.

\*\* Statistically significant at the 5% level, \* Statistically significant at the 10% level



**Table 7 - Effects of the Perceived Brexit-vote**

		coefficient		
		% Brexit-vote in the South East		
		OLS	IV	n
[ 1 ]	Index Views	0.0054 [0.0021]**	0.0067 [0.0040]	329
[ 2 ]	Index Policy	0.0041 [0.0020]*	0.0084 [0.0031]**	317
[ 3 ]	Second IAT_D	-0.0002 [0.0012]	-0.0026 [0.0028]	253
[ 4 ]	Third IAT_D	-0.0003 [0.0007]	0.0005 [0.0016]	279
[ 5 ]	Amount given	0.0034 [0.0105]	-0.0260 [0.01443]*	168
[ 6 ]	Gave less than 5	-0.0007 [0.0021]	0.0072 [0.0036]*	168
	Amount given to:			
[ 7 ]	Henry	0.0075 [0.0133]	-0.0664 [0.0446]	55
[ 8 ]	Hans	0.0069 [0.0282]	-0.0552 [0.0329]	56
[ 9 ]	Pawel	0.0129 [0.0193]	0.0336 [0.0343]	57
	Gave less than £ 5 to:			
[ 10 ]	Henry	-0.0014 [0.0028]	0.0118 [0.0104]	55
[ 11 ]	Hans	0.0014 [0.0066]	0.0218 [0.0080]**	56
[ 12 ]	Pawel	-0.0027 [0.0040]	-0.0074 [0.0061]	57

Notes: Each entry in columns [1] and [2] presents estimates for a separate regression. All regressions include covariates for gender, marital status, political party preference indicators and dummies for whether the participant is British and if the participant was recruited from the general public. Regressions in row 4-5 also include control for pre-determined IAT. Robust standard errors are clustered at the session-day level.

\*\* Statistically significant at the 5% level, \* Statistically significant at the 10% level

**Table 8- Heterogeneous Effects**

Panel A: by Performance on the Election Results Questions

	Surprising Information (mostly incorrect answers)					Non-surprising Information (mostly correct answers)				
	Index	Amount	Gave	Third IAT_D	Index	Amount	Gave	Third IAT_D		
	Views	Policy	given	less than 5	Views	Policy	given	less than 5		
	[ 1 ]	[ 2 ]	[ 3 ]	[ 4 ]	[ 5 ]	[ 6 ]	[ 7 ]	[ 8 ]	[ 9 ]	[ 10 ]
Control mean	0.077	0.069	4.375	0.167	0.544	-0.055	-0.056	4.545	0.212	0.531
Leave	0.2395 [0.0957]**	0.1229 [0.1549]	-0.6699 [0.7356]	0.2800 [0.1681]	-0.0358 [0.0762]	0.0474 [0.1029]	0.0861 [0.1179]	0.0269 [0.5032]	0.0070 [0.0955]	-0.0291 [0.0483]
Remain	-0.1081 [0.1188]	-0.0905 [0.1925]	0.5140 [0.3670]	-0.0420 [0.0985]	-0.0437 [0.0381]	-0.0376 [0.1058]	-0.0494 [0.1123]	0.3523 [0.6721]	-0.0816 [0.1456]	-0.0170 [0.0573]
p-value (Remain=Leave)	0.1%	23.9%	9.5%	8.0%	91.7%	48.2%	21.7%	54.5%	52.1%	81.8%
n	131	128	66	66	106	198	189	94	94	174

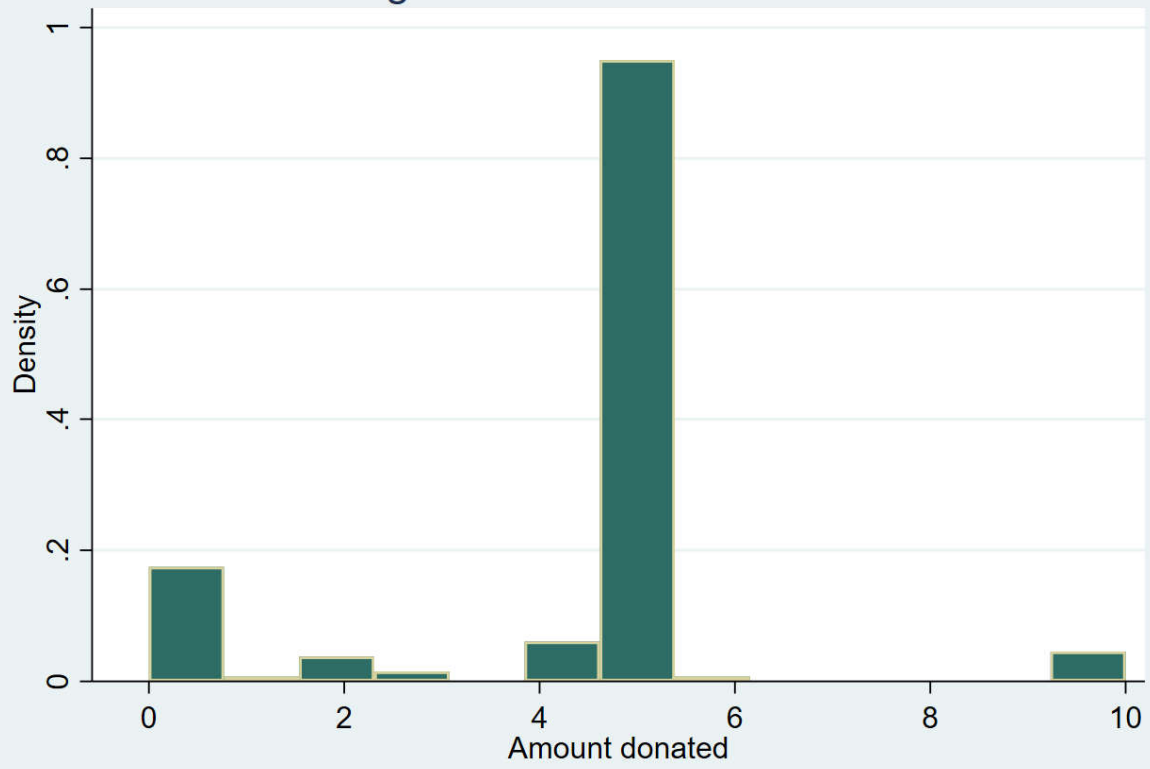
Panel B: by Political Views and Nationality

	Likely Pro-Remain					Likely Pro-Leave				
	Index	Amount	Gave	Third IAT_D	Index	Amount	Gave	Third IAT_D		
	Views	Policy	given	less than 5	Views	Policy	given	less than 5		
	[ 1 ]	[ 2 ]	[ 3 ]	[ 4 ]	[ 5 ]	[ 6 ]	[ 7 ]	[ 8 ]	[ 9 ]	[ 10 ]
Control mean	-0.197	-0.311	4.483	0.172	0.499	0.308	0.467	4.464	0.214	0.607
Leave	0.0973 [0.0695]	0.1338 [0.0671]*	-0.3292 [0.3413]	0.1141 [0.1054]	-0.0259 [0.0338]	-0.0514 [0.1501]	-0.0272 [0.2355]	0.0449 [0.5200]	-0.0030 [0.1064]	-0.0368 [0.0818]
Remain	-0.0203 [0.0477]	0.0708 [0.0771]	-0.1147 [0.4333]	0.0586 [0.1153]	-0.0218 [0.0395]	-0.2014 [0.1691]	-0.5046 [0.1532]***	0.5772 [0.5481]	-0.1650 [0.0871]*	-0.0742 [0.0816]
p-value (Remain=Leave)	13.5%	30.5%	53.2%	46.9%	90.9%	39.4%	2.1%	21.9%	11.1%	66.6%
n	225	217	90	90	197	104	100	71	71	83

Notes: The third IAT\_D refers to the IAT administered by the end of the survey. Each column presents estimates for a separate regression. All regressions in Panel A include covariates for gender, marital status, political party preference indicators, dummies for whether the participant is British and if the participant was recruited from the general public and score for the first two quiz questions (the same for all). All regressions in Panel B include covariates for gender, marital status, and a dummy for whether the participant was recruited from the general public. The regressions in columns 4 and 8 (in Panel A and B) also control for pre-determined IAT. Robust standard errors are clustered at the day-place level.

\*\* Statistically significant at the 5% level, \* Statistically significant at the 10% level

Figure A1 - Amount Donated



## **A1- Survey Structure**

Part 1. Consent

Part 2. Demographics and Implicit Association Test 1

Part 3. Quiz – Experimental Intervention

Part 4. Implicit Association Test 2

Part 5. Dictator Game

Part 6. Guesses on Vote-share results

Part 7. Views on Each other, and on immigrants

Part 8. Immigrant's contribution to the UK

Part 9. Policy Questions

Part 10. Previous contact with stimulus places and immigrants

Part 11. Implicit Association Test 3

Part 12. Earnings and end of the survey

**Table A1 - Outcomes - Summary Statistics**

	Mean	Stand Dev	Min	Max	Obs
Agree: The South East of England is made a better place by people coming to live in the UK from Europe	0.6757	0.4688	0	1	333
Agree: London is made a better place by people coming to live in the UK from Europe	0.7688	0.4223	0	1	333
Agree: Europeans who come to the South East take out more than put in	0.2054	0.4046	0	1	331
Agree: Europeans who come to London take out more than put in	0.2115	0.4090	0	1	331
Agree: foreign people should leave in their own neighborhood	0.1471	0.3548	0	1	333
Agree: foreign people could get along without support if they tried harder	0.3453	0.4762	0	1	333
Index Views_Contribution	0.0047	0.7660	-0.5649	1.7905	331
Index Views	-0.0229	0.5663	-0.5818	1.7868	331
Second IAT_D	0.5849	0.3102	-0.7293	1.2998	254
Third IAT_D	0.4959	0.3121	-0.6916	1.2133	283
Agree: Target to reduce migration	0.3283	0.4703	0	1	329
Agree: Quota for non-Europeans settlement	0.3374	0.4735	0	1	329
Agree: Quota for Europeans settlement	0.3009	0.4594	0	1	329
Agree: UK should leave the EU in the long-run	0.1850	0.3889	0	1	319
Agree: NHS should be free for all	0.4134	0.4932	0	1	329
Agree: End of multi-lingual formatting on official documents	0.2000	0.4006	0	1	330
Index Policy	-0.0482	0.6346	-0.7132	1.5340	319
Amount given	4.3275	2.0661	0	10	171
Proportion that Gave less than 5	0.2281	0.4208	0	1	171
Amount given to Henry	4.1786	2.1835	0	10	56
Amount given to Hans	4.3333	2.0731	0	10	57
Amount given to Pawel	4.4655	1.9665	0	10	58
Proportion gave less than £5 to Henry	0.2679	0.4469	0	1	56
Proportion gave less than £5 to Hans	0.2281	0.4233	0	1	57
Proportion gave less than £5 to Pawel	0.1897	0.3955	0	1	58

**Table A2 - Number of Observations by Treatment and Nationality**

Nationality:	British			European		All	
	Dictator - giving to:			Recipient	Recipient		
	Henry	Hans	Pawel	(I)	(II)	(I) + (II)	
	(a)	(b)	(c)	(d)	(a)-(d)		
Remain	20	19	19	28	86	28	114
Control	17	19	20	28	84	30	114
Leave	19	19	19	28	85	29	114
Total	56	57	58	84	255	87	342

**Table A3 - Effects of Treatments on Giving**

	Amount given	Gave less than £ 5		Amount given	Gave less than £ 5
Leave	-0.8272 [0.7370]	0.0839 [0.1444]	Leave	-0.4725 [0.5146]	0.0319 [0.1002]
Remain	0.3782 [0.8680]	-0.1659 [0.1520]	Remain	0.4594 [0.8193]	-0.1998 [0.1255]
Henry	0.0038 [0.7466]	0.1101 [0.1348]	Henry	-0.4299 [0.7803]	0.1864 [0.0882]*
Remain x Hans	0.1841 [0.8826]	0.0331 [0.1579]	Remain x Pawel	-0.8805 [1.2667]	0.3415 [0.1620]*
Leave x Hans	0.5595 [1.3387]	0.1066 [0.2493]	Leave x Pawel	0.7893 [0.7585]	-0.0824 [0.1077]
Covariates	yes	yes	Covariates	yes	yes
Observations	Henry and Hans		Observations	Henry and Pawel	
n	113	113	n	114	114

Notes: Each column presents estimates for a separate regression. All regressions include covariates for gender, marital status, political party preference indicators and dummies for whether the participant was recruited from the general public. Robust standard errors are clustered at the session-day level.

\*\* Statistically significant at the 5% level, \* Statistically significant at the 10% level

**Table A4 -First Stage Regressions**

Dependent variable:	Guessed 'Leave' vote share in the South East of England	
	[1]	[2]
Control mean	51.60	51.60
Leave	8.871399 [1.5078]***	8.927193 [1.8164]***
Remain	-8.97487 [1.5281]***	-9.099169 [1.4203]***
p-value (Remain=Leave)	0.0%	0.0%
Covariates	No	Yes
Observations	334	331

Notes: Covariates for gender, marital status, political party preference indicators and dummies for whether the participant is British and if the participant was recruited from the general public. Robust standard errors are clustered at the session-day level.

\*\*\* Statistically significant at the 1% level.



**Table A5 - Effects of the Perceived Brexit-vote**

	coefficient		n
	% Brexit-vote in the South East		
	OLS	IV	
Agree: The South East of England is made a better place by people coming to live in the UK from Europe	-0.0040 [0.0016]**	-0.0022 [0.0022]	331
Agree: London is made a better place by people coming to live in the UK from Europe	-0.0019 [0.0012]	-0.0025 [0.0025]	331
Agree: Europeans who come to the South East take out more than put in	0.0034 [0.0017]*	0.0037 [0.0029]	329
Agree: Europeans who come to London take out more than put in	0.0047 [0.0013]**	0.0052 [0.0023]**	329
Agree: foreign people should leave in their own neighborhood	0.0009 [0.0012]	-0.0008 [0.0031]	331
Agree: foreign people could get along without support	0.0021 [0.0022]	0.0067 [0.0034]*	331
Target to reduce migration	0.0020 [0.0013]	0.0024 [0.0029]	327
Quota for non-Europeans settlement	0.0017 [0.0017]	-0.0012 [0.0019]	327
Quota for Europeans settlement	0.0030 [0.0016]*	0.0017 [0.0027]	327
UK should leave the EU in the long-run	0.0008 [0.0012]	0.0036 [0.0025]	317
End of multi-lingual formatting on official documents	0.0017 [0.0012]	0.0051 [0.0022]**	328
NHS should be free for all	-0.0028 [0.0014]*	-0.0062 [0.0029]*	327

Notes: Each entry in columns [1] and [2] presents estimates for a separate regression. All regressions include covariates for gender, marital status, political party preference indicators and dummies for whether the participant is British and if the participant was recruited from the general public. Robust standard errors are clustered at the session-day level.

\*\* Statistically significant at the 5% level, \* Statistically significant at the 10% level

**Table A6: Determinants of "Leave Vote"**

	OLS		
	coefficient	stand error	p-value
Cooperative Party	0.4558	0.1080	0.0010
Conservative Party	0.4102	0.1110	0.0030
Green Party	-0.1412	0.2273	0.5450
I don't know (omitted)			
I prefer not to say	-0.5442	0.1080	0.0000
Labour Party	0.0778	0.1919	0.6920
Liberal Democrat	0.0068	0.2434	0.9780
No party Preference (omitted)	0.3096	0.1240	0.0270
Other Party	0.7619	0.0750	0.0000
Plaid Cymru (omitted)			
UK Independence Party	0.4558	0.1080	0.0010
British	0.3061	0.0839	0.0030
constant	0.2381	0.0750	0.0070

Notes: the sample includes only individuals in the control group. The dependent variable is based on the individual view on the future relationship between the EU and the UK. It has value 1 if the individual answered "Leave the European Union" or "Stay in the EU, but reduce its powers". It assumes 0 if the individual answered "Leave the things they are" or "Stay in the EU and increase its power" or "Work for a single European government". Robust standard errors are clustered at the session-day level.

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