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# Hate Trumps Love: The Impact of Political Polarization on Social Preferences

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## Abstract

Political polarization has ruptured the fabric of U.S. society. Across 5 pre-registered studies comprising 13 behavioral experiments and a diverse set of close to 8,000 participants, the focus of this paper is to examine various layers of (non-)strategic decision-making that are plausibly affected by existing polarization. Through the lens of one's feelings of *hate* and *love* for Donald J. Trump, I document the behavioral-, belief-, and norm-based mechanisms through which perceptions of interpersonal closeness, altruism, and cooperativeness are affected, both within and between political factions. I find strong heterogeneous effects: ingroup-love occurs in the *perceptional* domain (how close one feels towards others), whereas outgroup-hate occurs in the *behavioral* domain (how one helps/harms/cooperates with others). The rich setting also allows me to examine the mechanisms: the observed intergroup conflict can be attributed to one's grim expectations about the cooperativeness of the opposing faction, rather than one's *actual* unwillingness to cooperate. A final set of experiments reveals that two popular behavioral interventions (defaults and norm-nudging) alone are insufficient to eradicate the detrimental behavioral impact of polarization.

*Keywords:* Identity, Norms, Nudging, Polarization, Social Preferences

*JEL:* B41, D01, D9

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## 1. Introduction

Rising political polarization coincides with and is often linked to fractured societies rife with racial inequality, factional conflict, and partisan animosity (Dixit and Weibull, 2007; Fiorina and Abrams, 2008; Iyengar and Westwood, 2015; Bénabou and Tirole, 2016; Reich, 2017; Autor et al., 2020; Bursztyn et al., 2020a; Graham and Svolik, 2020). At its core, polarization undermines social contracts that are necessary for a functioning society: it restrains social interactions across polarized clusters, impedes cooperativeness, trust, and altruism between political factions, and thus poses a credible threat to democratic values.[1] This is amplified by *false polarization*, the perception of more polarization regarding policy issues than actually exists (Levendusky and Malhotra, 2016; Moore-Berg et al., 2020).

Political polarization yields direct social welfare implications in that it may affect one's willingness to engage in altruistic behavior and the collective provision of goods both within and between factions (Henrich et al., 2001; Fehr and Fischbacher, 2003; Bowles and Gintis, 2013). Arguably, not all consequences of political polarization are created equal and can be tackled with the same policies. This warrants going beyond existing research and offering a trifecta approach – as put forward in this study – of examining the manifestation of polarization across beliefs, behaviors, and attitudes separately. In particular, I examine experimentally the behavioral-, belief-, and norm-based mechanisms with which such political intergroup conflict materializes in both strategic and non-strategic decision contexts that capture cooperativeness, altruism, and anti-social behavior.

On a theoretical level, the aggregate social consequences of polarization are unclear. For one, polarization (and the resulting hostile climate) can produce enough outgroup animosity to reduce individual willingness to support and cooperate with members of the opposite faction. For another, it may also – or instead – increase intra-faction cooperation; for instance, by promoting a sense of shared identity. To assess the social impact of polarization, it is thus important to compare within- and between-group behaviors in a polarized environment that enables both strategic and non-strategic considerations. Rather than resorting to surveys, I quantify these phenomena through the lens of controlled experiments. Although partisanship is found to exacerbate cross-faction discrimination, prior work has often attributed this behavior to a mix of ingroup-love and outgroup-hate by pitting one

[1] Recent examples include the divide over wearing face masks as preventative measures from COVID-19 infections: https://www.nytimes.com/interactive/2020/07/17/upshot/coronavirus-face-mask-map.html.

group against another.[2] The results from the experiments presented in this paper show that these are not necessarily two sides of the same coin and that depending on the decision environment, ingroup-love and outgroup-hate can co-exist independently from each other.

Across 5 pre-registered studies that contain 13 incentive-compatible experiments and a diverse set of close to 8,000 individuals, I approach these important questions from several angles: non-strategic decisions, strategic decisions, nudge interventions, and norm perceptions. With that, I attempt to provide a comprehensive examination of the forms in which polarization occurs, how they vary across those domains, and how to alleviate it. I focus on two aspects of decision-making within and across political factions. The first is behavioral: how does polarization in the context of political identities affect pro-/anti-social decisions, cooperation, and social expectations in both strategic and non-strategic environments? Do these take shape in form of ingroup-love, outgroup-hate, or both simultaneously? Humans are known to bond over common identity markers (often exemplified by one's preference *for* something or someone), the study of which has its origins in social science in the form of ingroup-outgroup favoritism and social identity (Tajfel and Turner, 1979; Alesina et al., 1999; Akerlof and Kranton, 2000; Bernhard et al., 2006; Efferson et al., 2008; Halevy et al., 2008). The second is perceptional: are these behavioral differences consistent with the observed variations in perceived interpersonal closeness and social norms and thus help to explain *why* we observe these differences within and between political factions?

With that, my investigative approach is consistent with and speaks to the growing discussion on affective polarization – the animosity between and distrust towards members of the opposing faction (Druckman and Levendusky, 2019; Iyengar et al., 2019). Donald Trump is a polarizing figure and the current symbol of the Republican party (Jacobson, 2019), which is captured by the novel measures that I put forward here. By comparing these differences for political identities to differences for minimal group identities, I also contribute to the aforementioned *groupy* behavior (Kranton and Sanders, 2017) literature in that the impact of partisan animosity on ingroup-love and outgroup-hate can be examined separately. I introduce disparate feelings of polarization by using a participant's repugnance against (henceforth referred to as *hate*) or relish for (henceforth referred to as *love*) the 45th president: Donald J. Trump. This is a particularly expedient setting since Trump's actions during his 2016 presidency have been linked to increased social divergence and

[2] Greene, 1999; Abramowitz and Saunders, 2006; Mason, 2015; Michelitch, 2015; Orr and Huber, 2020; West and Iyengar, 2020. See also Yamagishi and Mifune, 2009; Amira et al., 2019; Iyengar et al., 2019.

hate-related consequences.[3] To tease out the role of the emotional state that is produced by the partisan divide, I also run the same experimental conditions with a separate set of participants using the minimal group prime (following Tajfel and Turner, 1979; Chen and Li, 2009), where one's preferences for Klee or Kandinsky paintings are the identity markers, instead of one's opinion about Trump.

Arguably, the combination of these settings allows me to disentangle how beliefs, preferences, and norms drive polarization both separately and combined. The analyses presented here can be subdivided into several steps that logically build on each other:

In Study 1 (Section 2.1, Experiments 1 and 2 ), I examine the impact of polarization in a *non-strategic* context by contributing to the literature on pro- and anti-social behavior utilizing an extended dictator game, to which I will refer to as the Take-or-Give (T-o-G) Dictator Game. One crucial feature of this game is that, in addition to being able to give money to the recipient, participants can exhibit anti-social behavior by taking money from the recipient (see List, 2007; Bardsley, 2008; Dimant, 2019). By employing a context in which strategic motives are eliminated by design, the results reveal how one's identity shapes altruistic preferences towards ingroups and outgroups as defined by their political preferences towards Donald J. Trump. To separate ingroup-love from outgroup-hate, the political setting (Experiment 1) is contrasted with a minimal identity setting (Experiment 2) using another set of participants who otherwise play the same experiment.

In Study 2 (Section 2.2, Experiments 3 and 4): I examine the impact of polarization in a *strategic* context by borrowing from the "Attitudes-Beliefs-Contributions (ABC) of cooperation" approach as introduced by Fischbacher et al. (2001) and Gächter et al. (2017). This method is nested in three variants of a public goods game: a one-shot sequential public goods game played with the strategy method to measure attitudes of cooperation, a belief-elicitation task to measure expectations of others' cooperation, and a one-shot simultaneous public goods game played with the direct response method to measure effective contributions. This approach allows me to answer important and policy-relevant questions: does the negative impact of polarization arise because people expect individuals from the opposite faction to be less cooperative (a belief channel)? Or is it the consequence of a lower willingness to cooperate with members of the opposite faction, no matter how cooperative

[3] See, e.g., Abramowitz and Webster, 2018; Mason, 2018; Müller and Schwarz, 2019; Klein, 2020. The consequences of hate are conspicuous and often erupt in form of social movements and protests (Meyer, 2004; Madestam et al., 2013; Mazumder, 2018; Cantoni et al., 2019).

they are (a preference channel)? Distinguishing these mechanisms is vital because it allows me to identify whether a society is truly fractured across factions or whether, in principle, cooperation might be sustained through appropriate belief management. As before, I compare the impact of the political identity (Experiment 3) markers with that of a minimal group prime (Experiment 4) to distinguish between ingroup-love and outgroup-hate.

In Study 3 (Section 3.1, Experiment 5), I employ the social norm elicitation procedure by Krupka and Weber (2013) to examine the extent to which the observed behavioral differences can be mapped onto the social norm perceptions within and between political factions as exemplified by pro-/anti-Trump preferences.

In Study 4 (Section 3.2, Experiments 6 – 9), I test the robustness of the presented behavioral results of Experiments 1 and 2 by examining the beliefs, attitudes, altruistic, and cooperative behaviors (both in a strategic and non-strategic settings) using one's hate/love towards the 46th president of the United States, Joseph R. Biden (Experiments 6 and 7), and towards sports (Experiments 8 and 9) as identity marker.

Finally, in Study 5 (Section 3.3, Experiments 10 – 13), I shed light on a crucial and policy-relevant question: can we utilize simple and cost-effective behavioral interventions, which have proven successful across various settings, to reduce the pernicious impact that political polarization produces in the contexts studied here? To do so, I am harnessing the power of nudging. In particular, I am employing two nudges that the literature has identified as the most effective and most widely used behavioral interventions (e.g., Benartzi et al., 2017; Bicchieri and Dimant, 2019; Jachimowicz et al., 2019; Beshears and Kosowsky, 2020): norm-nudging and the default. To the best of my knowledge, my paper is the first to examine whether nudges have enough potency to reduce the observed polarization.

Across all experiments, the results highlight that partisan animosity evokes a state that affects social preferences, beliefs, and attitudes of both a strategic and non-strategic nature. In particular, by comparing the results between the Trump prime and minimal group prime treatments, I find that ingroup-love only occurs in the context of how one perceives *interpersonal closeness* to others; conversely, outgroup-hate is manifested in one's reduced *altruism* and *cooperativeness* with the opposing faction, as well as in the form of pessimistic beliefs about the opposing faction's cooperativeness. This confirms that the results are not driven by ingroup-outgroup considerations alone, but that the observed disparities in perceptions, beliefs, and own cooperativeness instead largely rest on the emotional state that is evoked by affective polarization. Connecting this to insights from the norm-elicitation experiment, the scientific contribution and main takeaway is that partisan identity not only drives costly social behavior, in part due to pessimistic beliefs, but it also comports with social norms that people perceive. Importantly, the examined behavioral interventions – while shifting the level of pro-social behavior – show little success in reducing the detrimental impact of polarization, leaving the gap essentially unchanged.

Against this backdrop, while my findings indicate that the impact of affective polarization can be picked up across all studied (perceptional and behavioral) measures, the results emphasize the nuanced composition of affective polarization: the partisan rift might be not as forlorn as previously suggested. In the contexts studied here, the adverse behavioral impact of intergroup conflict can be attributed to one's grim expectations about the cooperativeness of the opposing faction, rather than one's categorical unwillingness to cooperate. However, the tested nudge interventions suggest that alleviating these negative effects is not straightforward. Importantly, the nudge-interventions presented here have demonstrated the limits of light-touch behavioral interventions may be insufficient in reducing the current state of affective polarization. This is noteworthy since these results complement existing research suggesting that one may be able to alleviate the pernicious outcomes by correcting the misguided beliefs about the preferences and actions of the opposing faction.[4] From a policy perspective, however, it is evident that both structural and institutional changes need to be introduced, on top of behavioral ones to eliminate affective polarization.

Section 2.1 (Section 2.2) details experiments in which the research question is examined in a non-strategic (strategic) context using Donald Trump and minimal group identities. Section 3 then examines the robustness of polarization and what to do about it. In particular, Section 3.1 presents an experiment that contains the results from the norm elicitation for both (non-)strategic contexts. Section 3.2 presents the (non-)strategic behavioral experiments using Joe Biden as the relevant political identity and sports as relevant non-political identity. Section 3.3 details the nudge experiments. Section 4 concludes.

[4] Existing research points to ways in which such social beliefs can be corrected – or at the least abate their inaccuracy – and utilized in the context of polarization (Flynn et al., 2017; Ahler and Sood, 2018; Stanley et al., 2020, fro a cross-cultural perspective see Ruggeri et al., 2020). Crucially, however, the set of studies presented here has one crucial advantage and differs from those studies in that I employ incentive-compatible behavioral experiments to measure the perceptional and behavioral impact of affective polarization. The above-mentioned literature does so using (often non-incentivized or not incentive-compatible) surveys. An avenue for future research is to put more weight on the role of context and methodological approaches and uncover the various forms in which affective polarization occurs and can be contained when actions matter.

## 2. Experimental Analysis

Across 13 experiments, data from a total of $n = 7,893$ participants was collected between the summer and winter of 2020.[5] Table 1 breaks down the observations by experiments and what part of the data is analyzed in the main text compared to the appendix.

| *Experiments* | DG (all) | DG (after dropping according to pre-reg criteria) | DG (analyzed in the main text) | DG (data for additional analyses in appendix) | PGG (all) | PGG (after dropping according to pre-reg criteria) | PGG (analyzed in the main text) | PGG (data for additional analyses in appendix) |
|---|---|---|---|---|---|---|---|---|
| **Trump Prime** | 738 | 588 | 417 | 171 | 648 | 517 | 375 | 142 |
| **Minimal Group Prime** | 650 | 574 | 384 | 190 | 612 | 499 | 343 | 156 |
| **Norm Elicitation** | 298 | 232 | - | 232 | 298 | 232 | - | 232 |
| **Biden Prime** | 661 | 458 | 333 | 125 | 706 | 406 | 299 | 107 |
| **Sports Prime** | 450 | 405 | 321 | 84 | 442 | 361 | 277 | 84 |
| **Default Nudge** | 530 | 424 | 310 | 114 | 714 | 490 | 337 | 153 |
| **Information Nudge** | 526 | 464 | 383 | 81 | 566 | 442 | 341 | 101 |
| *Sum* | *3853* | *3145* | *2148* | *997* | *3986* | *2947* | *1972* | *975* |

**Table 1:** Number of observations across 13 experiments (the norm elicitation experiment is accounted for once because this is the only within-participant design: participants saw both the DG and PGG setting). Numbers for the DG only reflect the data collected for dictators. Data was dropped from the analyses according to the pre-registration protocols (failed attention/comprehension checks and a participant's indifference towards Donald Trump / Joe Biden / sports). Removal of participants is uncorrelated with the treatments and the presented results are not sensitive to the inclusion of these participants (available upon request). Each section details the exact data-handling procedure.

### *2.1. Impact of Polarization in a **Non-Strategic** Context*

### *2.1.1. Data Collection and Experimental Design*

In this experiment (same as in all experiments presented in this paper), data is collected without the use of deception for two types of primes using a between-subject design: the *Trump prime (TP)* and the *Minimal Group Paradigm (MGP) prime* and most of the analyses will be based on comparing the differences of the differences in these identity settings. In TP, participants are asked to state their love/hate opinion about Trump after seeing a picture of Trump wearing a MAGA hat.[6] Participants are then randomized into one of three conditions that vary by the type information that they receive about their

[5] Since MTurk is known to be liberal-leaning, I over-sampled in order to collect enough data for the Trump lovers and Biden haters, respectively. As correctly anticipated, those who indicated to love Trump appeared in the data about $\frac{1}{3}$ of the time. I calibrate the required sample size to obtain high statistical power based on a classroom pre-test that yielded an effect size of 0.54. Consequently, the power calculations yielded that 50 participants per cell are needed in order to achieve 80% at an alpha of 0.05. To ensure high quality data collection on MTurk, I utilized a combination of CAPTCHAs and screening questions to avoid pool contamination. I applied the following restrictions to the participant pool: U.S.-based, approval rate greater than 95%, and could participate only once in any of the three experiments presented in this paper. This corresponds to the recommended best practices to maximize data quality (Buhrmester et al., 2018).

[6] As per pre-registration #42538, only participants who indicated to either hate or love Trump are analyzed, whereas participants who were indifferent are not analyzed. My reasoning for this is to align the analysis with the research question and focus on the role of polarization. This renders the indifferent participants (that MTurk cannot screen out ahead of time) obsolete.

randomly assigned partner. That is, participants randomly observed that their matched partner either loved Trump, hated Trump, or had an undisclosed Trump opinion.

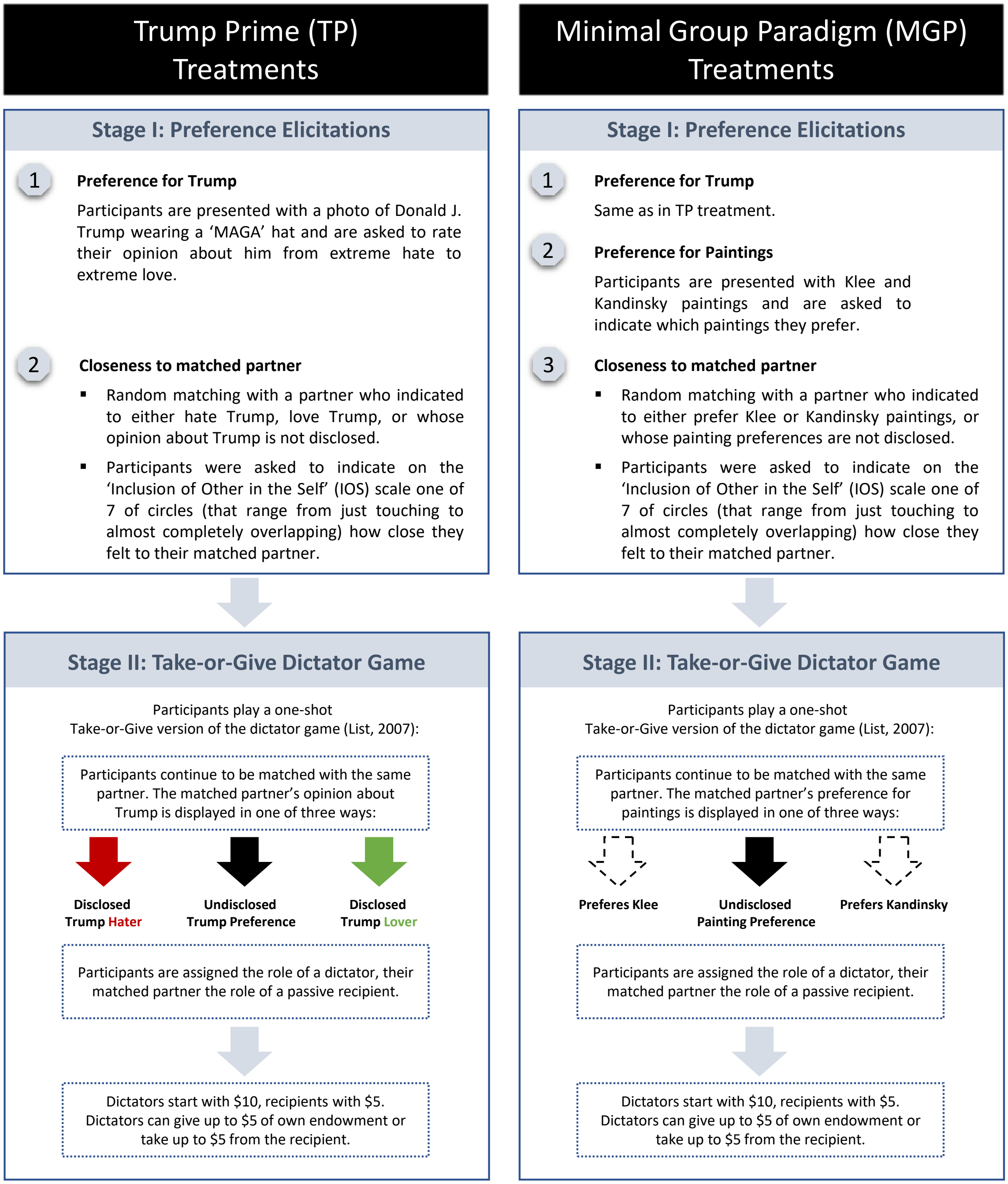
In MGP, participants also start by seeing the same picture of and stating their opinion about Trump. Immediately afterwards they are presented with Klee and Kandinsky paintings, asked to choose which they prefer, and these preferences – not their Trump opinion – are then used in the subsequent matching. That is, participants randomly observed that their matched partner either preferred Klee, Kandinsky, or had an undisclosed painting preference, while not knowing that partner's Trump preference.[7] This procedure allows me to keep the role of the Trump prime constant across treatments and focus on the sole effect of being matched according to one's (mis)matched Trump or painting preferences. Thus, conditional on their own Trump opinion/painting preference, participants were allocated to one of the partner preferences conditions at random. Consequently, the between-design captures the dimensions: 2 *(prime)* × 2 *(own Trump/painting preference)* × 3 *(partner's preference)*. Figure 1 illustrates the experimental design.

In sum, this variant of the Dictator Game allows me to take the first step towards investigating the impact of affective polarization on altruism, which – unlike regular Dictator Games – also provides me with the opportunity to study both pro-social (giving) and anti-social (taking) behavior simultaneously. Moreover, the contrast with the minimal group prime adds an additional layer of detail in that I am able to distinguish whether the observed behavior with the political prime resembles ingroup-love, outgroup-hate, or both.

Note that, however, the condition in which the partner's opinion about Trump or preference for paintings is *not* revealed to the participant are relegated to the Online Appendix. I do this for two reasons: for one, the hate-love analysis is the main focus of this paper whereas the *unknown opinion/preference* condition is a robustness check. For another, as expected, both perceived closeness with and behavior towards a person with an undisclosed Trump/paintings preference fall right in between the results presented here.

The design of this experiment is straightforward and consisted of two stages (details for all stages were announced sequentially): a belief elicitation stage (divided into two parts) followed by a take-or-give Dictator Game. The experiment lasted 10 minutes and dictators earned an average of $4 (including a show-up payment of $0.25). This translates to an hourly wage of $24 and is well above average on MTurk (Hara et al., 2018).

[7] Data for recipients was collected separately and has no bearing on the results presented here.



Trump Prime (TP) Treatments

Stage I: Preference Elicitations

1 **Preference for Trump**

Participants are presented with a photo of Donald J. Trump wearing a 'MAGA' hat and are asked to rate their opinion about him from extreme hate to extreme love.

2 **Closeness to matched partner**

- Random matching with a partner who indicated to either hate Trump, love Trump, or whose opinion about Trump is not disclosed.
- Participants were asked to indicate on the 'Inclusion of Other in the Self' (IOS) scale one of 7 of circles (that range from just touching to almost completely overlapping) how close they felt to their matched partner.

Stage II: Take-or-Give Dictator Game

Participants play a one-shot Take-or-Give version of the dictator game (List, 2007):

Participants continue to be matched with the same partner. The matched partner's opinion about Trump is displayed in one of three ways:

**Disclosed Trump Hater**
**Undisclosed Trump Preference**
**Disclosed Trump Lover**

Participants are assigned the role of a dictator, their matched partner the role of a passive recipient.

Dictators start with $10, recipients with $5. Dictators can give up to $5 of own endowment or take up to $5 from the recipient.

Minimal Group Paradigm (MGP) Treatments

Stage I: Preference Elicitations

1 **Preference for Trump**

Same as in TP treatment.

2 **Preference for Paintings**

Participants are presented with Klee and Kandinsky paintings and are asked to indicate which paintings they prefer.

3 **Closeness to matched partner**

- Random matching with a partner who indicated to either prefer Klee or Kandinsky paintings, or whose painting preferences are not disclosed.
- Participants were asked to indicate on the 'Inclusion of Other in the Self' (IOS) scale one of 7 of circles (that range from just touching to almost completely overlapping) how close they felt to their matched partner.

Stage II: Take-or-Give Dictator Game

Participants play a one-shot Take-or-Give version of the dictator game (List, 2007):

Participants continue to be matched with the same partner. The matched partner's preference for paintings is displayed in one of three ways:

Participants are assigned the role of a dictator, their matched partner the role of a passive recipient.

Dictators start with $10, recipients with $5. Dictators can give up to $5 of own endowment or take up to $5 from the recipient.

**Figure 1:** Experimental design of the Take-or-Give Dictator Game for both the Trump Prime and the minimal group prime conditions. Note that, for the purpose of brevity, the results for the conditions in which participants were matched with a partner for whom the Trump/painting preference was not disclosed (indicated with a black arrow in this figure) are relegated to the Online Appendix.

### Stage I: Preference Elicitation

For the *Trump Prime* (TP) treatments, this stage was subdivided into two elicitations: one's opinion about Trump and one's perceived towards the matched partner.

1. In the first elicitation, participants were presented with a photo of Donald J. Trump and had to rate how they personally feel about him (with a focus on the time since he became president) on a 5-point Likert scale: extreme hate, moderate hate, indifferent, moderate love, or extreme love.[8] This method is adapted from the 'feelings thermometer' in the American National Election Study (ANES).
2. In the second elicitation, participants were randomly paired with another passive participant who said to either hate Trump (if they indicated either extreme or moderate hate), love Trump (if they indicated either extreme or love), or whose opinion about Trump was not disclosed. Participants were then asked to choose on the 'Inclusion of Other in the Self' (IOS) scale – a standard tool in social psychology to measure the *strength* of inter-personal closeness – one out of 7 of circles (ranging from touching to almost completely overlapping, see Figure OA.28 for illustration) how close they felt to their matched partner (Aron et al., 1992; Gächter et al., 2015).[9] In the analysis, this scale is converted to percentage (ratio of one's indicated value out of 7).

For the *Minimal Group Paradigm* (MGP) treatments, an additional elicitation stage was included: after eliciting one's opinion about Trump, participants were presented with several paintings from either Klee or Kandinsky and were asked to choose their favorite (design following Chen and Li, 2009). Subsequently, participants were matched with a partner at

[8] In accordance with the pre-registration, answers for moderate and extreme hate (love) were subsumed under 'hate' ('love') and were also done so in the matching procedure during the experiment. That is, in the treatments in which the matched partner's opinion about Trump was disclosed, participants only observed whether the partner indicated to hate or love Trump, but not the strength (extreme or moderate hate/love) of their opinion. Consequently, they will be treated as a bundled characteristic throughout the experiment. For a full distribution of opinions, see Figure A.1 in the Main Appendix. Regression results as presented in Tables A.1 and A.2 are robust to using the *intensity* of one's opinion about Trump rather than the binarized measure. Results are available upon request.

[9] In a highly-cited and highly-influential paper in the Journal of Personality and Social Psychology, Aron et al. (1992) introduced this intuitive and simple pictorial tool to measure bi-lateral relationships. Respondents are asked to assess their relationship with another individual (which, in my paper, varied based on the partner's Trump preference) by selecting one out of 7 pairs of increasingly overlapping circles. Respondents select the pair of circles that best describes their relationship with the matched partner. As later verified by Gächter et al. (2015), this scale is a "psychologically meaningful and highly reliable measure of the subjective closeness of relationships." I employ the scale in the *exact* way as in the original study.

random whose painting preferences were either disclosed or remained undisclosed. Thus, the matching procedure mirrors exactly the procedure in the TP treatments, except that the matching and the subsequent IOS closeness elicitation were done on the basis of painting preferences instead of Trump opinions.

It is worth stressing why beginning both experiments, TP and MGP, with an elicitation of participants' opinion towards Trump is prudent, even if the matching of MGP does not utilize their opinions about Trump. For one, doing so enables me to hold any residual effect of the thought about Trump constant across both treatments. For another, I can break down and compare the data in both treatments by one's own opinion of Trump, which is a necessary comparison when studying ingroup-love/outgroup-hate.

**Stage II: Take-or-Give Dictator Game**

In order to capture both pro-social (giving) and anti-social (taking) behavior simultaneously, I employ a variant of a dictator game that was inspired by existing research (List, 2007; Bardsley, 2008; Dimant, 2019). In this variant, both the dictator and the recipient start with a non-zero endowment and the dictator's action space is augmented with one additional option: the opportunity to take some or all money away from the recipient. One of the many advantages of using this modified version of the game is the ability to measure both pro-social and anti-social tendencies simultaneously (see Dimant (2019) for a discussion). Prior to making the decision, participants are told that – on top of the show-up fee – half of all randomly determined dictator-recipient pairs would be paid a bonus corresponding to their in-game decisions. The remainder half only receive the show-up fee.

For the purpose of my study, I borrow the initial endowment structure from List (2007): the dictator starts with \$10 whereas the recipient starts with \$5.[10] The dictator makes one of the following three decisions exactly once:

1. Take up to \$5 from the recipient's endowment and add to one's own endowment.
2. Make no change to the initial distribution of money.
3. Give out up to \$5 from one's own endowment and add to the recipient's endowment.

[10] To retain incentive-compatibility, dictators were told that their allocation decisions are paid out in 50% of the time as bonus at the end of the experiment. If not selected, they only received the show-up fee.

### *2.1.2. Hypotheses*

First, existing literature on identity, ingroup bias, and social proximity suggests that individuals will feel closer to participants who are more 'similar' to them, which will also show up in form of stronger pro-sociality (e.g., Akerlof, 1997; Akerlof and Kranton, 2000; Charness et al., 2007; Fowler and Kam, 2007; Chen and Li, 2009; Christ et al., 2014; Lees and Cikara, 2020). Compared to being matched with someone whose opinion of Trump is undisclosed, greater (lower) amount of pro-sociality and closeness towards a partner with the same Trump opinion will be labeled as *ingroup-love* (*outgroup-hate*).[11] Consequently:

$\mathbf{H_1}$**:** *Dictators will exhibit the largest closeness score and extent of pro-sociality towards a partner who has the same opinion of Trump (TH-TH or TL-TL), lowest when the matched partner's opinion is misaligned (TH-TL or TL-TH).*

What is more, as argued in the introduction, a contribution of this paper is to examine whether 'hate' is stronger than 'love'. If so, one would expect a disproportional effect for both closeness and displayed behavior that explains a host of existing phenomena, including asymmetries between positive and negative reciprocity as well as between the contagion of pro-/anti-social behavior (Offerman, 2002; Croson and Shang, 2008; Lelkes and Westwood, 2017; Dimant, 2019; Bicchieri et al., 2020a).

$\mathbf{H_2}$**:** *Dictators will exhibit disproportionately larger outgroup hate than ingroup love.*

### *2.1.3. Behavioral Results*

In what follows, results for both TP treatments and MGP treatments are presented in the same Figure 2. Results will be broken up along multiple dimensions for both perception of closeness (henceforth referred to as *perception*, for illustrative purposes presented as % of indicated closeness on a scale from 1 to 7) and behavior in the T-o-G dictator game (henceforth referred to as *behavior*, measured as % of dollar amount given to/taken away):[12]

- When the dictator is matched with a partner who has an aligned opinion about Trump (matching corresponds either to *Hate-Hate* or *Love-Love*) compared to being matched

[11] I follow Yamagishi and Mifune (2009) and define these terms as: *Ingroup-love* (*outgroup-hate*) indicates behavior that provides ingroup (outgroup) members with preferential (spiteful) treatment.

[12] Consistent with the pre-registration, the following statistical analyses will be performed in all three experiments: bootstrap two-sample t-test method (BSM) approach as proposed by Moffatt (2015) with 9999 replications. The BSM procedure retains cardinal information without distribution assumptions. Robustness checks will be performed using non-parametric Mann Whitney-U ranksum tests. Unless noted otherwise, the results can be assumed to be consistent between the two methods.

with a partner who has a **contrary opinion** about Trump (matching corresponds either to *Love-Hate* or *Hate-Love*). Results are presented in Figure 2.

- Same analysis, but broken down by a participant's opinion on Trump (hate or love). Results are presented in Figure 3.[13]

Comparing the perceived closeness and behavior between the Trump Prime treatments (top panel of Figure 2) and the minimal group prime treatments (bottom panel of Figure 2) yields a number of interesting patterns. First, it is evident that differences in both closeness and behavior only arise in TP and not in MGP, indicating that an ingroup-outgroup differentiation is evoked exclusively by the hate-love prime. Second, zooming in on the actual differences, one can observe that being matched with a partner with an aligned opinion leads to stronger perceived closeness (78.1% vs. 39.8%, BSM, $p<0.001$) as well as more pro-sociality (14.9% vs. -22.9%, BSM, $p<0.001$). Notably, I find a marked asymmetry between ingroup-love and outgroup-hate: the absolute negative average amount in the misaligned condition is over-proportionally larger than the positive average amount in the aligned condition ( $|-22.9\%|$ vs. 14.9%, BSM, $p<0.01$).[14] For MGP, the observed differences are trivial in size and neither significant for perception of closeness (37.5% vs. 39.1%, BSM, $p=0.51$) nor for take-or-give behavior (12.0% vs. 13.5%, BSM, $p=0.88$). I conclude that the affective polarization frame evokes an emotional state that produces traceable changes in both perceptions and behavior beyond the minimal group notion.

Lastly, taking these results together provides a clear indication of whether and where *ingroup-love*, *outgroup-hate*, or both simultaneously exist. In particular, perceptions of closeness towards participants with a contrary opinion (one's outgroup, 39.8%, red bar in top-left panel) are indistinguishable in TP and in MGP, whether compared to someone with the same preferences (37.5%, red bar bottom-left panel, $p=0.40$) or with the contrary preferences (39.1%, green bar bottom-left panel, $p=0.87$). Thus, the political priming produces no outgroup-hate with respect to perceived closeness. Conversely, one can clearly observe ingroup-love since participants felt much stronger closeness towards their own

[13] For ease of exposition, I present a more detailed breakdown of both perceived closeness and behavior when matched with another participant whose opinion of Trump was not revealed to the dictator in the Online Appendix (see, for example, Figure OA.2).

[14] See also Lelkes and Westwood (2017). It is worth noting that this asymmetry is seemingly not *per se* driven by differences between Trump haters and Trump lovers. As Figure OA.1 in the Online Appendix shows, both types display the same average perception of closeness (57.5% vs. 59.0%, BSM, $p=0.47$). However, it is driven by the fact that the average perceived closeness towards Trump Haters (65.7%) is significantly larger than the perceived closeness towards Trump lovers (53.8%, BSM, $p<0.001$).

political faction (78.1%, green bar in top-left panel) compared to the perceived closeness in the MGP. Interestingly, for actual behavior, one can observe a clear indication of outgroup-hate but no indication of ingroup-love: with essentially fully overlapping error bars, the pro-social behavior towards one's own political faction (14.97%, green bar in top-right panel) is indistinguishable from the behavior in MGP, regardless of whether their partners held the same (13.54%, green bar bottom-right panel, p=0.78) or different (11.99%, red bar bottom-right panel, p=0.56) painting preferences. Unambiguously, all of this is in stark contrast to the behavior observed when matched with someone who has a contrary opinion about Trump: the inflicted harm on this group is large (-22.9%, red bar top-right panel). In sum, the results are compelling as they indicate that ingroup-love and outgroup-hate are context-specific in that they only appear in the political prime. In other words, ingroup-love occurs for perceived closeness and outgroup-hate occurs for actual behavior.

Next, the same two dimensions (perception of closeness and behavior) are broken down by one's own opinion of Trump and are presented in Figure 3. For the conditions using the Trump Prime, I continue to find the previously observed and highly significant differences along both dimensions: for the perception of closeness, participants feel the strongest (weakest) connection with the matched partner that has the same (opposing) view about Trump (all p<0.001). The magnitudes and differences are comparable for both Trump haters and Trump lovers. Evidently, a similar pattern also arises for the measured behavior: only those who are matched with a partner with the same opinion on Trump display significant pro-social behavior on average (increase in the recipient's endowment), whereas those who are matched with a partner with opposing views about Trump leads to significant anti-social behavior on average (decrease in the recipient's endowment).

It is worth pointing out that the previously observed asymmetry in behavior (see right-hand side in Figure 2) now reappears in a more nuanced way: one can now observe that the absolute magnitude of anti-social behavior outweighing the absolute magnitude of pro-social behavior is driven by those who hate Trump (p<0.001), whereas the absolute magnitudes are not statistically different for those who love Trump (p=0.146).[15]
I find none of these differences in MGP, neither for perceived closeness nor for behavior. Notably, again, anti-social behavior in form of taking only occurs in the Trump Prime

[15] As illustrated in Figure OA.2 in the Online Appendix, both the perception of closeness and behavior towards a matched partner whose opinion about Trump was not disclosed falls in between the perceived closeness and behavior towards someone with an aligned and misaligned opinion about Trump.

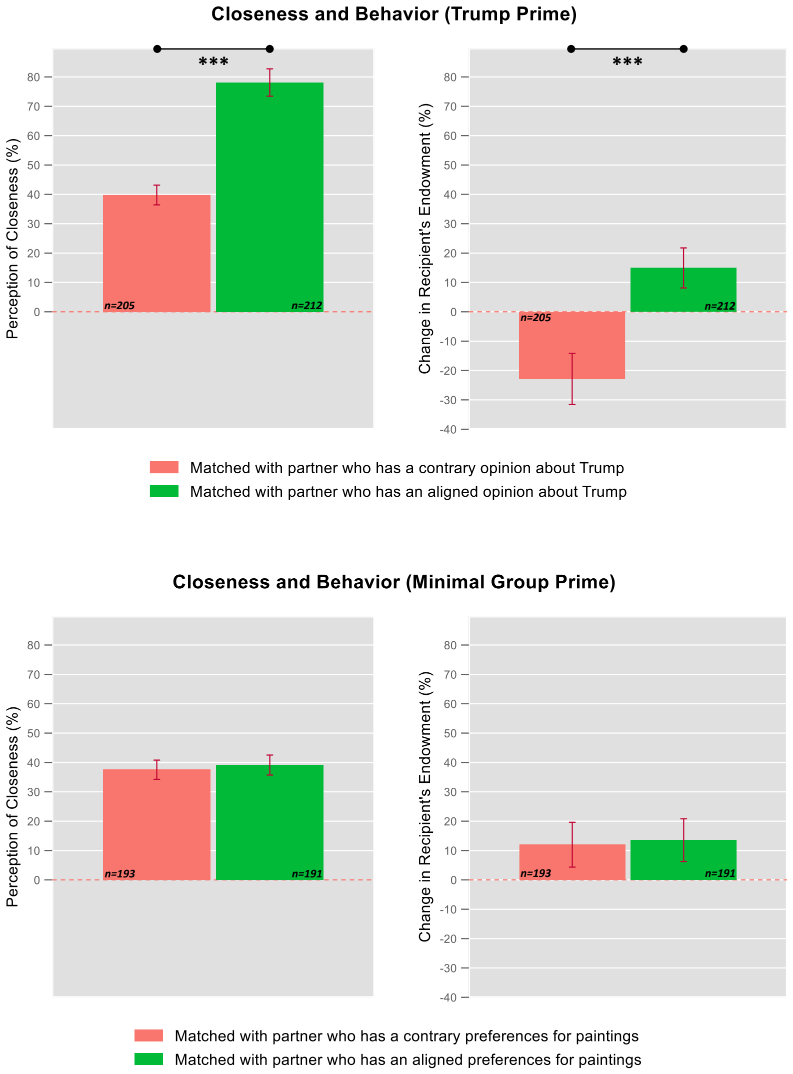


**Figure 2:** Closeness and behavior by being matched with a partner who has a (mis)aligned opinion about Trump for both TP and MGP treatments. Perception of closeness is converted from a 7-point scale to % for illustrative purposes. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

conditions while the extent of pro-social behavior in the minimal group prime conditions is indistinguishable from the behavior in the Trump Prime conditions. As later shown in Figure A.3, this maps well onto the different norm perceptions between Trump haters and lovers: the former make a clear distinction between harming their ingroup versus the outgroup, whereas the latter do not seem to make such a distinction.

Notably, I once again observe that the levels of perceived closeness in MGP are indistinguishable from that towards someone with a contrary opinion on Trump, and half as much than that towards someone with an aligned opinion on Trump. At the same time, the degree of pro-social behavior in MGP is the same as that of participants in the TP condition when matched with someone who has an aligned Trump opinion, and much higher than

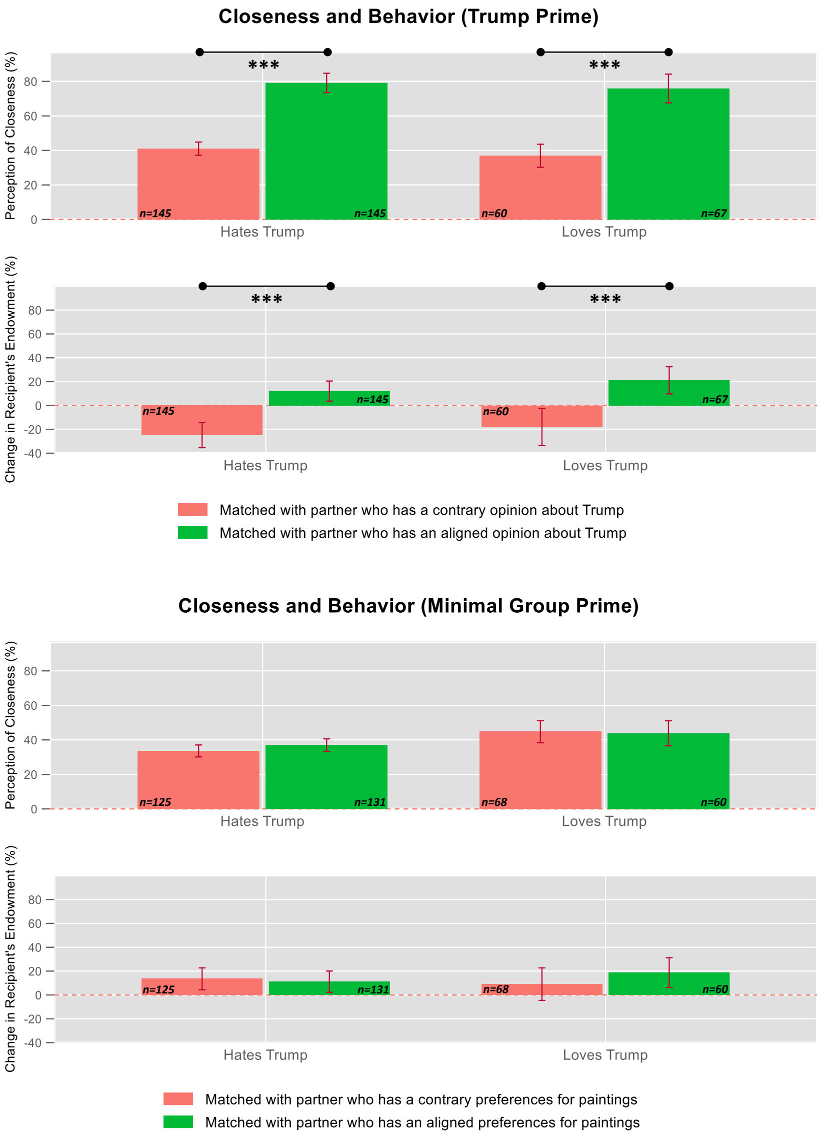


**Figure 3:** Closeness and behavior broken down by being matched with a partner who has a (mis)aligned opinion about Trump for both TP and MGP treatments. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

the overall anti-social behavior towards those with a contrary Trump opinion. Consistent with the previous findings from Figure 2, I conclude that the concept of ingroup-love and outgroup-hate is more nuanced than some existing research has suggested: in the context of non-strategic decisions, ingroup-love occurs with respect to perceived closeness, whereas outgroup-hate occurs with respect to altruistic behavior.

In a last step, the results are evaluated in a regression framework that includes the collected controls (age, gender, level of education, political affiliation, U.S. citizenship, whether one voted in the 2016 election, and race). Without qualifications, all previously presented findings hold and are presented in Table A.1 in the Main Appendix.

### *2.2. Impact of Polarization in a **Strategic** Context*

#### *2.2.1. Data Collection and Experimental Design*

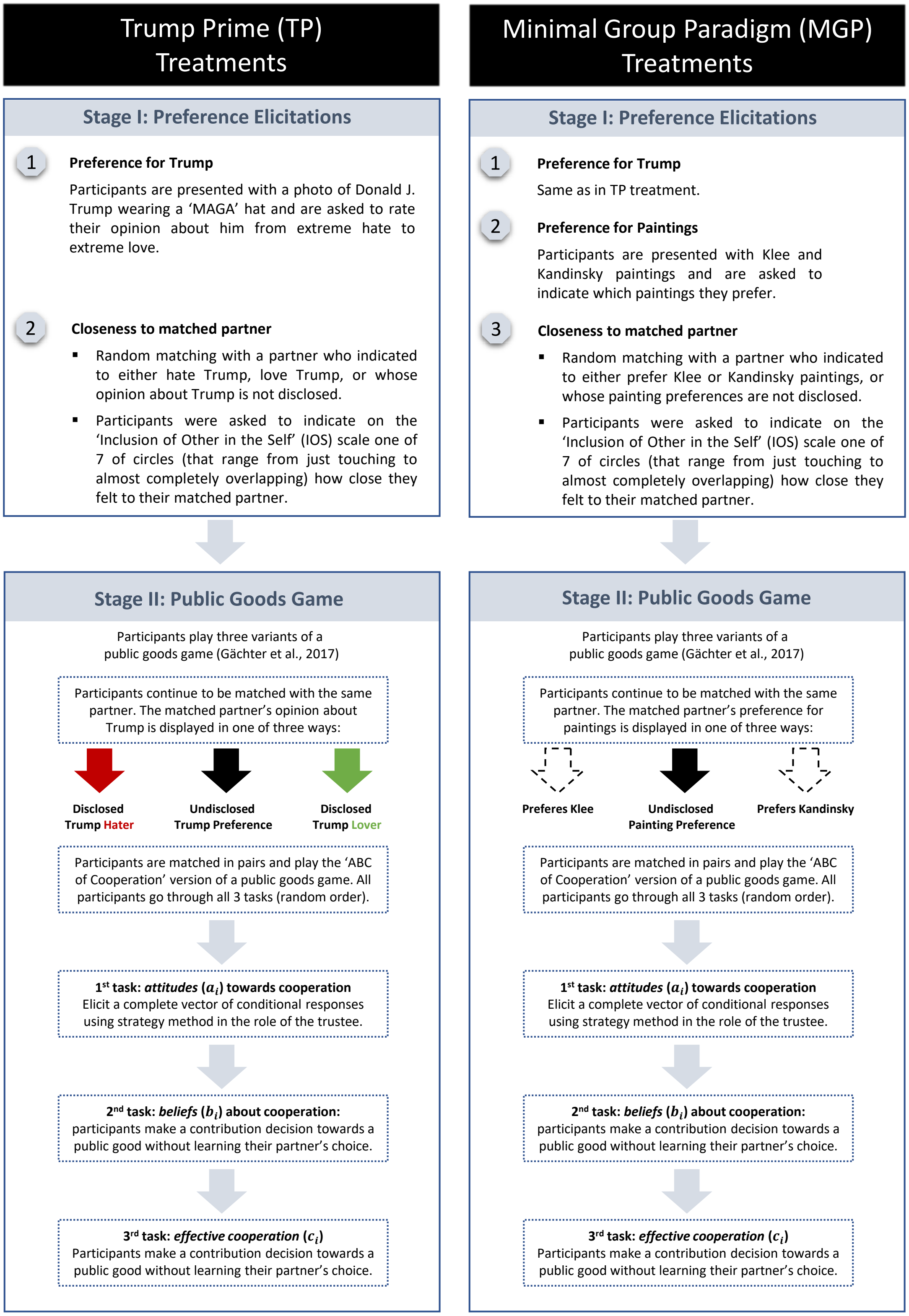
I capitalize on a 2 × 2 × 3 experimental design (Trump/minimal group prime × own opinion about Trump × matched partner's opinion about Trump / preference for paintings). Consistent with the analysis in Section 2.1, a total of 2 × 2 × 2 treatments will be analyzed in the main body of the paper. That is, as in the previous experiment, I only analyze the beliefs and behavior when participants were either matched with someone who had the same or contrary preferences towards Trump/paintings in the main text (for additional analyses see the Appendix and the Online Appendix).

**Treatment Variations**

This experiment consists of three tasks to measure participants' cooperativeness using the "ABC of cooperation" approach (Gächter et al., 2017): a one-shot sequential public goods game played with the strategy method to measure attitudes of cooperation, a belief-elicitation task to measure expectations of others' cooperation, and a one-shot simultaneous public goods game played with the direct response method to measure effective contributions. The treatment variations closely follow those from Experiment 1 (see Section 2.1.1 for more details). For the Trump Prime (TP) treatments, the public goods games will be played either by a pair of subjects with the same opinion about Trump (TH-TH or TL-TL), with an opposing opinion about Trump (TH-TL or TL-TH), or by participants for which the opinion about Trump are not disclosed to the other participant (TH-TU or TL-TU). The same applies for the minimal group prime (MGP) treatments in which participants are randomly matched based on own and the partner's painting preferences.[16] In sum, this PGG variant creates the necessary environment to answer my research questions in that it allows me to disentangle the mechanisms through which affective polarization operates. By contrasting this to the minimal group setting, I am able to distinguish between ingroup-love and outgroup hate. The design is detailed below and illustrated in Figure 4.

Subjects are matched in pairs and take part in three tasks that are based on the game explained above. All tasks are based on the following two-person, one-shot public goods game. To simplify the mental effort on the side of the participants, I follow the standard notion of the game and use an MPCR of 0.75 (Isaac and Walker, 1988): each player is

[16] Again, note that for the purpose of brevity, results for the conditions where one was matched with a partner for whom the opinions were undisclosed are relegated to the Online Appendix.



Trump Prime (TP) Treatments

Stage I: Preference Elicitations

1 **Preference for Trump**

Participants are presented with a photo of Donald J. Trump wearing a 'MAGA' hat and are asked to rate their opinion about him from extreme hate to extreme love.

2 **Closeness to matched partner**

- Random matching with a partner who indicated to either hate Trump, love Trump, or whose opinion about Trump is not disclosed.
- Participants were asked to indicate on the 'Inclusion of Other in the Self' (IOS) scale one of 7 of circles (that range from just touching to almost completely overlapping) how close they felt to their matched partner.

Stage II: Public Goods Game

Participants play three variants of a public goods game (Gächter et al., 2017)

Participants continue to be matched with the same partner. The matched partner's opinion about Trump is displayed in one of three ways:

Participants are matched in pairs and play the 'ABC of Cooperation' version of a public goods game. All participants go through all 3 tasks (random order).

**1st task: *attitudes* ($a_i$) towards cooperation**
Elicit a complete vector of conditional responses using strategy method in the role of the trustee.

**2nd task: *beliefs* ($b_i$) about cooperation:**
participants make a contribution decision towards a public good without learning their partner's choice.

**3rd task: *effective cooperation* ($c_i$)**
Participants make a contribution decision towards a public good without learning their partner's choice.

Minimal Group Paradigm (MGP) Treatments

Stage I: Preference Elicitations

1 **Preference for Trump**

Same as in TP treatment.

2 **Preference for Paintings**

Participants are presented with Klee and Kandinsky paintings and are asked to indicate which paintings they prefer.

3 **Closeness to matched partner**

- Random matching with a partner who indicated to either prefer Klee or Kandinsky paintings, or whose painting preferences are not disclosed.
- Participants were asked to indicate on the 'Inclusion of Other in the Self' (IOS) scale one of 7 of circles (that range from just touching to almost completely overlapping) how close they felt to their matched partner.

Stage II: Public Goods Game

Participants play three variants of a public goods game (Gächter et al., 2017)

Participants continue to be matched with the same partner. The matched partner's preference for paintings is displayed in one of three ways:

Participants are matched in pairs and play the 'ABC of Cooperation' version of a public goods game. All participants go through all 3 tasks (random order).

**1st task: *attitudes* ($a_i$) towards cooperation**
Elicit a complete vector of conditional responses using strategy method in the role of the trustee.

**2nd task: *beliefs* ($b_i$) about cooperation:**
participants make a contribution decision towards a public good without learning their partner's choice.

**3rd task: *effective cooperation* ($c_i$)**
Participants make a contribution decision towards a public good without learning their partner's choice.

**Figure 4:** Experimental design of the Public Goods Game for both the Trump Prime and the minimal group prime conditions. Note that, for the purpose of brevity, the results for the conditions in which participants were matched with a partner for whom the Trump/painting preference was not disclosed (indicated with a black arrow in this figure) are relegated to the Online Appendix.

endowed with $10 that she can either contribute to the public good or keep for herself. Participants are able to give any integer amount between 0 and 10, thus providing eleven options in total. Each dollar contributed to the public good is multiplied by 1.5 and then equally divided between the two participants, irrespective of the individual‘s contribution. As can be seen, the game embodies the classic tension between private and collective interest: while fully contributing to the public goods maximizes joint payoffs, each player's self-interest is maximized by contributing nothing. Subjects play the tasks sequentially and in random order, but receive no feedback on choices or earnings in any of the tasks until the end of the experiment. Only one of the three tasks is used to calculate earnings, and subjects are made aware of this fact at the beginning of the experiment. The task used for calculating payments is randomly selected at the end of the experiment, after subjects' choices in all tasks have been collected. The average pay resulted in about $6.15 (including a $0.25 show-up fee). It took participants on average 15 minutes to complete the experiment, which translates to an hourly payoff of about $24.6, and thus essentially identical to the average payoff in Experiment 1.

In the first task, I use a version of the game described above to measure players' attitudes towards cooperation. Subjects are randomly assigned to be either a first-mover or a second-mover, and only their choices in the relevant role are used to compute payoffs.[17] In order to do so, participants play the game sequentially and I use the strategy method to elicit the second-mover's choices. That is, second-movers are asked to submit a contribution decision for each possible contribution choice made by the first-mover. This ensures that, for each second-mover, one can observe a vector of contributions comprised of eleven choices. I denote subject's $i$ contribution vector as $a_{\mathrm{i}}$. I use this vector of contributions to classify subjects into "cooperation types" that reflect their underlying willingness to cooperate as a function of their opponent's cooperativeness. Following the standard procedure introduced by Fischbacher et al. (2001), subjects are classified into four types:

- *Free riders* if they contribute $0, regardless of the first-mover's contribution.
- *Conditional cooperators* if they have a vector of contributions that is either weakly monotonically increasing in relationship to the first-mover's contribution, or is not monotonically increasing but has a highly significant (at the 1% level) and positive

[17] The task is played using role-uncertainty. That is, all subjects are asked to provide decisions in both the role of first-mover and second-mover, without knowing which role they will actually be assigned in the task until *after* all decisions have been collected.

Spearman rank correlation coefficient (between own and others' contribution).

- *Unconditional cooperators* if they contribute a positive amount that does not vary across different first-mover's contributions.
- *Other* if they cannot be classified according to any of the previous criteria.

In the second task, I elicit subjects' expectations about the cooperativeness of their opponent. Subjects are asked to guess the contribution that their opponent has made in the simultaneous public goods game (i.e., the second task). Subjects are rewarded for the accuracy of their guess: if their guess is within $2, they receive a bonus of $0.50. I denote the subject's $i$ belief regarding the opponent's contribution as $b_{\text{i}}$.

In the third task, I elicit subjects' effective contributions using a simultaneous version of the public goods game described above. Subjects make a contribution decision in direct-response mode, without learning the contribution choice of their opponent. I denote subject's $i$ effective vector as $c_{\text{i}}$.

### *2.2.2. Hypotheses*

In line with the previously reviewed literature and the hypotheses presented in Experiment 1, an ingroup-love/outgroup-hate effect can be expected.[18]

**$\mathbf{H_3}$:** *Participants will exhibit stronger closeness, more pronounced attitudes towards cooperation ($a_i$), higher beliefs about the partner's cooperativeness ($b_i$), and more effective cooperation ($c_i$) when matched with a partner who has the same opinion about Trump (TH-TH or TL-TL), whereas these numbers are the lowest when the matched partner's Trump opinion is misaligned (TH-TL or TL-TH).*

As before, this experiment will also examine the asymmetry between hate and love along the tested dimensions.

**$\mathbf{H_4}$:** *Participants will exhibit disproportionately larger outgroup-hate than ingroup-love.*

### *2.2.3. Results*

The results from both the *Trump Prime* and the *minimal group prime* reveal a pattern that is consistent with my previous findings: when matched with a partner who has an aligned

[18] As before, while the main focus of this experiment will focus on beliefs and behaviors towards own and opposing factions, the comparison with the participant for whom the opinion about Trump is not disclosed allows me to make to draw an inference about *whether* the observed behavior is ingroup-love or outgroup hate, or both. For brevity, I relegate these pairwise comparisons to the Online Appendix.

opinion about Trump, participants felt closer, had higher expectations of the partner's contribution, and effectively contributed more in the PGG (top panel of Figure 5) as compared to when participants were matched with a partner who had a contrary opinion about Trump (all p<0.01). In stark contrast, none of these differences appear in the minimal group prime conditions (bottom panel of Figure 5).

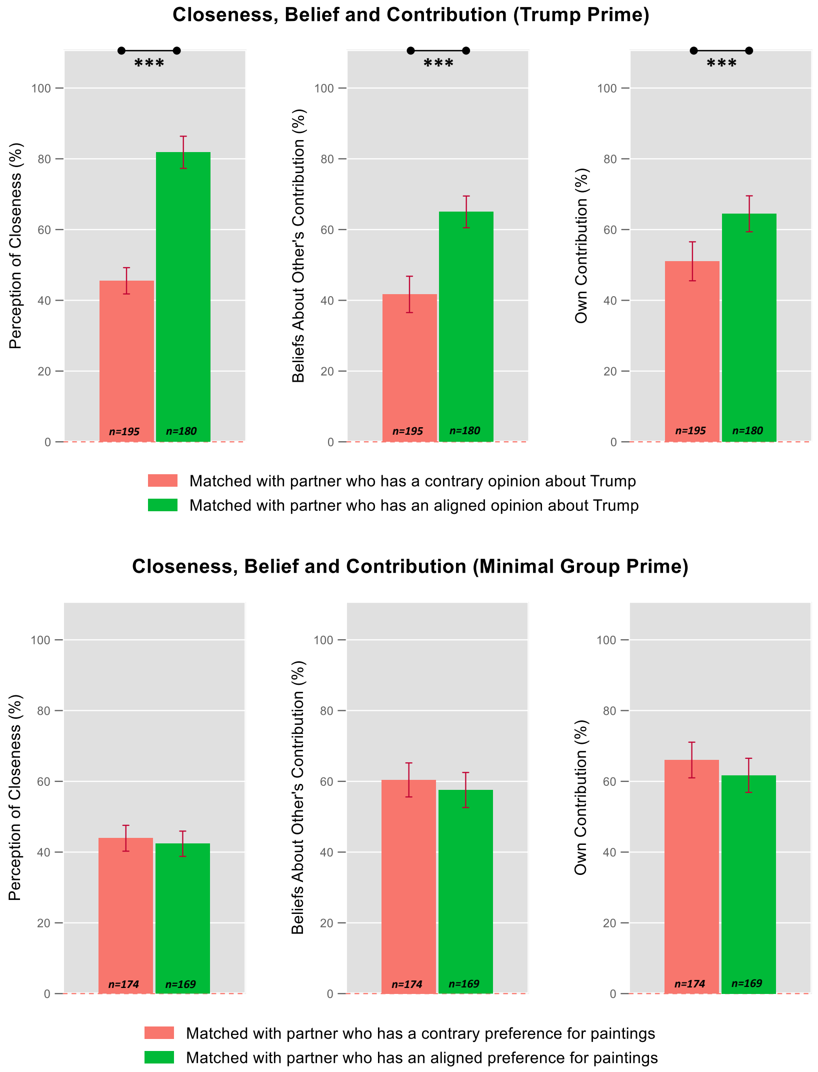


**Figure 5:** Closeness, belief, and behavior by being matched with a partner who has a (mis)aligned opinion about Trump for both TP and MGP treatments. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

As is the case for Experiment 1, by comparing the beliefs and behaviors in TP with those in MGP, one can also make statements about whether the observed results derive from ingroup-love, outgroup-hate, or both. Consistent with those previous results, one can again clearly see that the pattern of perceived closeness is one of ingroup-love (red bars have about the same height, whereas the green bars are much higher in TP than in MGP). On the contrary, for both beliefs about other's contributions and one‘s own contribution, we observe outgroup-hate rather than ingroup-love (green bars have about the same height, whereas the red bars are much lower in TP than in MGP).

Next, I zoom in on the perception of closeness, the beliefs ($b_{\mathrm{i}}$) about other's contributions and one's own effective contributions ($c_{\mathrm{i}}$) in the PGG, and present the results in Figure 6. For Trump haters, the results are remarkably consistent: for all three measures, the magnitude is significantly higher when matched with another Trump hater (all comparisons p<0.001). For the Trump lovers, on the other hand, one can observe that the discrimination between ingroup and outgroup only holds for the perceived closeness and $b_{\mathrm{i}}$, but not for $c_{\mathrm{i}}$. There, Trump lovers contribute a statistically indistinguishable amount of about 55-62% of the maximum amount, irrespective of whether they were matched with another Trump lover or a Trump hater (p=0.253). As later shown in Figure A.5, these findings are consistent with the norm elicitation: Trump lovers do not display an ingroup/outgroup differentiation in terms of free riding or cooperation, whereas Trump haters do. The regressions in Table A.2 (presented in the Main Appendix) confirm these results, and it is evident that the observed behavioral differences are driven by the differences in perceived closeness. As before, no significant differences occur along all these dimensions for the minimal group prime conditions (bottom Figure 6). This confirms again that the results are not driven by ingroup-outgroup considerations alone, but that the observed disparities in perceptions, beliefs, and own cooperativeness largely rest on the emotional state that comes with the affective polarization.

As before, I examine whether the results reflect ingroup-love, outgroup-hate, or both by comparing both beliefs and behaviors in TP to those in MGP. I reach the same conclusions as above for both those who hate Trump and those who love Trump: ingroup-love occurs for perception of closeness, whereas outgroup-hate occurs for beliefs about other's contributions and one's own contribution.[19] In addition, Trump lovers have expectations

[19] This finding is further confirmed when comparing one's beliefs about other's contribution and one's own contribution in the treatment where participants were matched with someone whose Trump opinion is not disclosed. This comparison is largely insignificant (significant) when tested against beliefs and behaviors towards a partner with the same (contrary) opinion on Trump. A detailed breakdown including

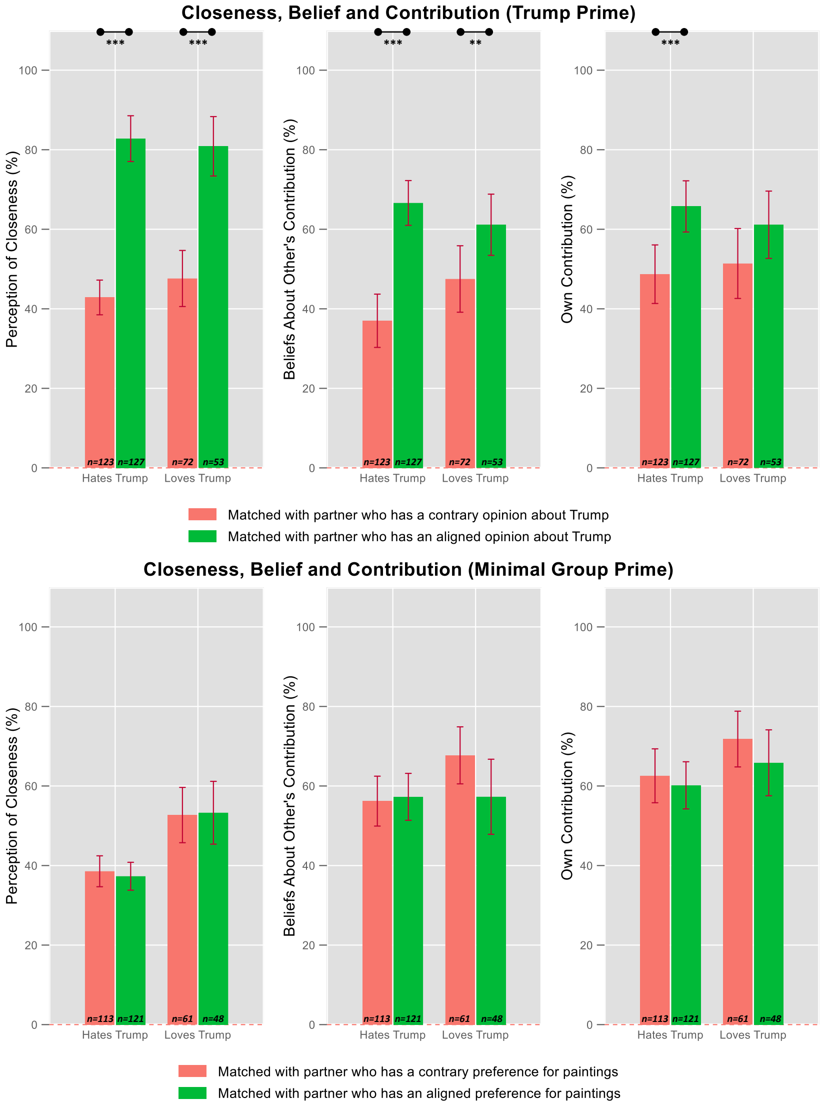


**Figure 6:** Closeness, belief, and behavior by being matched with a partner who has a (mis)aligned opinion about Trump for both TP and MGP treatments. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

about the contributions of both their ingroup and outgroup that are quite correct; Trump haters less so. Consistent with the theme and the findings of this paper, ingroup-love and outgroup-hate are nuanced concepts and that their impact depends on what is investigated.

For the final part of the investigation, I follow the tradition of Fischbacher et al. (2001) and analyze the distribution of 'types' across the various treatments. I follow the previously introduced classification and distinguish between *Conditional Cooperators* (CC), *Unconditional Cooperators* (UC), *Free Riders* (FR), and *Others* (see Section 2.2.1 for details).

the treatment in which participants were matched with a partner whose preference towards Trump was not disclosed is illustrated in Figure OA.4 in the Online Appendix.

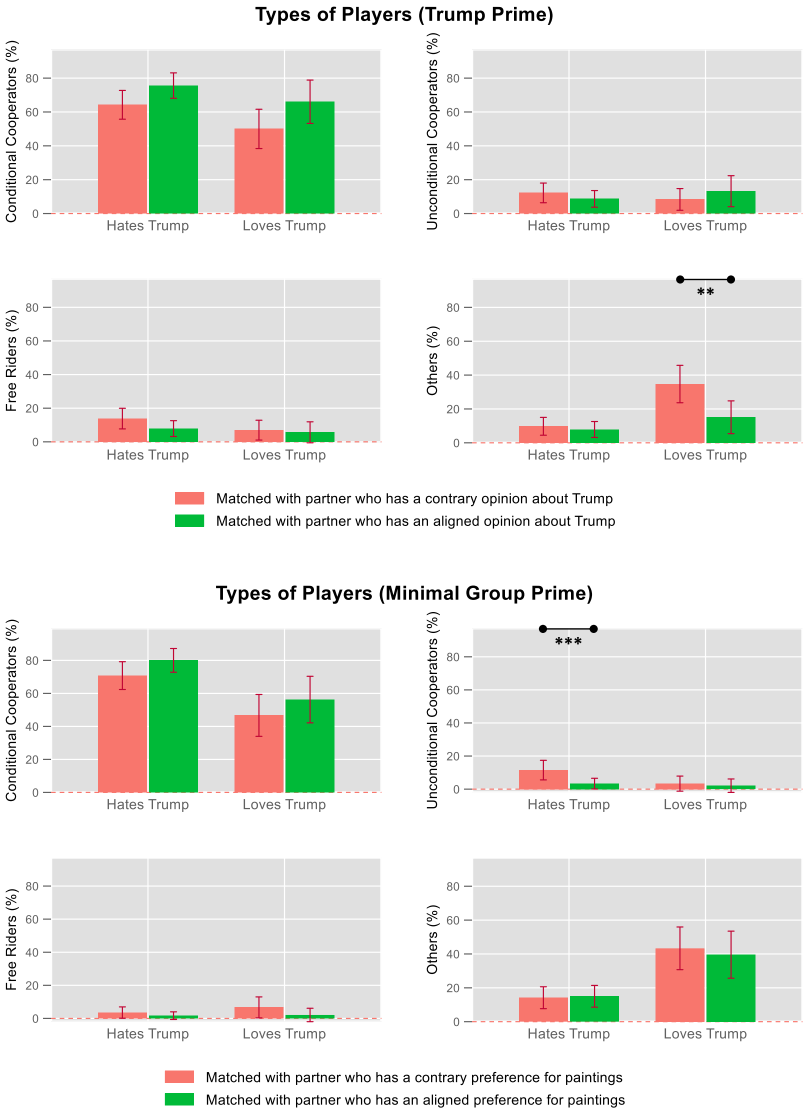


**Figure 7:** Types (conditional cooperators, unconditional cooperators, free riders, others) by being matched with a partner who has a (mis)aligned opinion about Trump for both TP and MGP treatments. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

Zooming in, one can observe that essentially all type classification are insensitive to whom one is matched with, regardless of the treatment prime (Figure 7).[20] In combination with the previous insights from the Trump prime conditions, this is a key result worth stressing: the observed inter-faction animosity in form of ingroup/outgroup variability in

[20] Most differences do not achieve the pre-registered alpha level of 5%. For TP, the only significant differences is observed for the 'Others' group with p=0.011. Although visually distinct, the differences for Conditional Cooperators only achieve significance at the 10% level at p=0.06 and p=0.09 for Trump-hater and Trump-lover, respectively. For MGP, the only reliably significant difference (p<0.01) can be observed for the Unconditional Cooperators among Trump haters. For Conditional Cooperators, the differences reach p=0.11 and p=0.34 for Trump haters and Trump lovers, respectively.

contributions is a result of fallacious beliefs about the other's behavior (see top panel of Figure 6) and *not* of adverse preferences per se (see top panel of Figure 7). In the latter, it becomes apparent that participants are willing to cooperate with the opposing faction, regardless of one's partisanship. The implication is that affective polarization should be counteracted by correcting the bleak expectations that the factions have about each other.

## 3. Extent and Robustness of Polarization (and What to do About it)

Up to this point, a plethora of experimental conditions and analyses support one clear conclusion: affective polarization runs deep and affects beliefs, behaviors, and the perception of social norms both in strategic and non-strategic settings. With this in mind, three policy-relevant questions arise naturally:

1. What are the social norms in the (non-)strategic contexts studied here and are the observed behaviors consistent with them?

2. Are the results presented here specific to Donald J. Trump or are they representative of the politically polarized environment in the U.S. more generally?

3. What can we do about it? More precisely, what tools does behavioral science offer us to achieve positive behavior change?

Thus, in a final step, this paper also sheds light on all three questions using pre-registered variants of the (non-)strategic behavioral experiments as introduced in Sections 2.1 and 2.2 as well as the social norm elicitation technique by Krupka and Weber (2013).

### *3.1. Social Norms in (Non-)Strategic Contexts*

In this experiment, I analyze the norm perceptions of Trump haters and Trump lovers utilizing the incentive-compatible approach by Krupka and Weber (2013) across various contexts. The contribution of this experiment is to understand whether the social norm perceptions map onto the heterogeneous ingroup-love and outgroup-hate by contrasting the results of this experiment with the previously discussed results (Sections 2.1 and 2.2). For altruism, varying norm perceptions by the Left and Right can be expected (Thomsson and Vostroknutov, 2017) and remain an empirical question in the context of cooperativeness.

### *3.1.1. Data Collection and Experimental Design*

To maximize statistical power and explore all variants of the behavioral experiments, the design of the norm elicitation contains both between- and within-subject variation:

- **Between-subject variation:** As before, participants first see a picture of Donald J. Trump and are asked to indicate on a Likert scale how they feel about him. Thus, hate and love towards Trump constitute the between-subject dimension.
- **Within-subject variation:** In random order, participants were informed of the structure of the T-o-G dictator game and PGG exactly as it had been explained to participants in Experiment 1 and Experiment 2. Subsequently, using the elicitation technique of Krupka and Weber (2013), participants were asked to rate the appropriateness of various behaviors in those games that were presented in random order.[21] To stay as close to the original designs as possible, these ratings were elicited from the perspective of being matched with other participants who either had the same, the opposite, or an unknown opinion about Trump. Participants observed all three variations in random order. Importantly, to ensure reliable norm-inferences, each participant's beliefs were elicited only from the perspective of one's own opinion about Trump.[22] These matching variations constitute the three within-subject dimensions.

In sum, the two within- and three between-subject variations represent exactly the same 2 × 3 = 6 dimensions, the same dimensions explored in Experiments 1 and 2. To achieve proper statistical power, observations from a total of n=298 participants were collected (leaving me with n=232 participants after applying pre-registered removal criteria[23]), neither of which have previously participated in Experiment 1 or Experiment 2. Out of these, 162

[21] As is customary in this norm elicitation procedure, the participants were asked to rate the appropriateness of the observed behavior along four dimensions: *Very Socially Inappropriate* (VSI), *Somewhat Socially Inappropriate* (SI), *Somewhat Socially Appropriate* (SA), and *Very Socially Appropriate* (VSA). For the dictator game, participants were asked to rate the appropriateness for three distinct behaviors: the dictator making no change to the initial endowments, the dictator taking money from the receiver, and the dictator giving money to the receiver. For the PGG, the participants rated the appropriateness for four distinct behaviors: contribute nothing, contribute nothing when others contribute something (= free-rider), contribute everything (= full cooperator), and contribute more the more the matched partner contributes (= conditional cooperator). Other results are relegated to the Online Appendix.

[22] A participant who indicated to hate Trump would only be asked to rate the appropriateness of various behaviors based on the matching of a Trump-hater with either another Trump-hater, a Trump-lover, or with an unknown Trump opinion. Similarly, a Trump-lover would only be asked to rate the appropriateness from the perspective of another Trump-lover having been matched with one of the three possible partners.

[23] As per pre-registration #42540, unusable data were dropped either because participants said to be indifferent about Trump or because they did not pass the checks.

participants (70%) indicated to hate Trump and 70 participants (30%) indicated to love Trump – a split comparable to the one obtained in Experiments 1 and 2.

#### *3.1.2. Results*

For the purpose of exposition – and because the results are so clear – all illustrations and analyses are relegated to the (Online) Appendix (norms in Experiment 1: Figures A.2, A.3, OA.5; norms in Experiment 2: Figures A.4, A.5, OA.6, OA.7).

From these results, one can conclude that the perceived social norms map convincingly onto the behaviors observed in both the T-o-G dictator game and 'ABC of Cooperation' public goods game. With that, the elicited norms can explain the observed behavioral differences between Trump haters and Trump lovers as well as their perceptions and attitudes towards people with aligned and misaligned opinions about Donald J. Trump. This has important policy implications: understanding the extent to which behavior (mis)aligns with existing social norms enables policy makers to nudge norm enforcement more successfully (Dimant and Gesche, 2020) and, if needed, complement this with the right combination of norm-messaging and punishment (Bicchieri et al., 2019).

### *3.2. Robustness of Affective Polarization in the Context of Joseph R. Biden and Sports*

To investigate the robustness of the results as presented in Experiments 1 and 2, I devise four additional pre-registered experiments that examine affective polarization in the context of both the 46th president of the United States, Joseph R. Biden, and Sports. The goal is to understand whether the obtained results – stark ingroup-love/outgroup hate differentiation along the dimensions of perceptions of closeness and behavior (altruism in the dictator game; attitudes, beliefs, and cooperation in the public goods game) – are specific to Trump, or are representative of a societal rift in the U.S. more generally (Stewart et al., 2020).

The choice of Joe Biden is straightforward since he was the presidential contender of Donald Trump in 2020 and ultimately prevailed. In addition, I attempted to find a setting that polarized to a comparable degree in the U.S. but is largely unpolitical. To find such a setting, I use data from the dating app *Hater* to find the most contentious topics.[24] As illustrated in Figure A.6, among the most contentious topics are sports (such as Soccer,

[24] The dating app 'Hater', backed by Mark Cuban, utilizes repulsion as a social glue to facilitate love connections (with self-reported success). It matches people based on their joint hate along several dimensions, including fandom for celebrities, food (e.g., pineapple on pizza), lifestyle choices, religion, or sports.

Football, Mixed Martial Arts, and Lacrosse). I subsume these under 'sports' and use them as a prime in the experiments, as explained in more detail below.

### *3.2.1. Data Collection and Experimental Design*

I follow the experimental protocol of Experiment 1 and Experiment 2 and examine again the facets of affective polarization in both the extended dictator game as well as the modified public goods game. The structure of the design is borrowed directly from the Minimal Group Prime (MGP) conditions with the *only* difference being that – rather than seeing and indicating their preference for Klee and Kandinsky paintings (after seeing a picture of Trump) – participants now first see the same picture of Trump and then either a picture of Joe Biden or a generic picture representing sports. Thus, participants first expressed their opinion about Trump and then expressed their opinion about Biden. Subsequently, just like in the MGP conditions with paintings, participants are now randomly matched with other participants according to their *Biden* or *sports* preferences. To that end, behavior from $n = 2,259$ participants ($n = 1,367$ for the Biden prime and $n = 892$ for the sports prime) were collected between December 2020 and January 2021 (that is, between the 2020 election and official inauguration of President Joe Biden).

### *3.2.2. Results*

For the purpose of brevity, the illustrations and statistical analyses are relegated to the (Online) Appendix. To foreshadow the results, I find that the original Trump-related insights from Experiments 1 and 2 replicate using a Biden prime instead of a Trump prime. This includes the striking ingroup-love/outgroup-hate differentiation in terms of:

- Perception of closeness and the shape of altruism in a non-strategic context (Figures OA.8, OA.9, and OA.10 in the Online Appendix)
- Perception of closeness and the shape of attitudes, beliefs, and cooperation in a strategic context (Figures OA.11, OA.12, and OA.13 in the Online Appendix)

With that, I conclude that the previously observed results are reflective of a deeper societal rift that is not limited to the 45th president and extends to politics more generally.

For the sports prime, the results are more nuanced:

- For both the perception of closeness and the shape of altruism in a non-strategic setting (Figures OA.16, OA.15, and OA.16 in the Online Appendix) the results are consistent with the previous Trump Prime results: dictators are pro-social (give about 10% of the money) to those who have an aligned opinion about sports and anti-social (take about 10% of the money) to those who have a contrary opinion about sports.

- Interestingly, in the strategic context, the sports prime produces no differences with respect to attitudes, beliefs, or cooperation (Figures OA.17, OA.18, and OA.19 in the Online Appendix) and is thus most similar to the Minimal Group Prime results.

Taking together, the results from the sports prime suggest that substantial polarization exists also in non-political contexts (based on the ingroup/outgroup differentiation for inter-personal perception that are comparable in size to the one observed using political primes). However, while it carries over to pro-/anti-social behavior in the non-strategic extended DG setting, it does not emerge in the strategic PGG setting. This suggests that affective polarization is indeed more pervasive.

### *3.3. Can Nudges Reduce the Detrimental Impact of Polarization?*

Lastly, I am harnessing the power of nudging to test whether such behavioral interventions, as popularized by Thaler and Sunstein (2008), have enough potency to reduce the observed polarization and with that mute the observed detrimental impact on altruism and cooperativeness. To the best of my knowledge, this paper is the first to do so. I examine the upper-bound of what a best-case scenario looks like and capitalize on two types of nudges that the literature has identified as both the most effective and widely used behavioral interventions: a default nudge ($n = 1,244$) and a norm-information nudge ($n = 1,092$).[25]

To this end, I devise four pre-registered follow-up experiments that follow the experimental procedures as explained in Sections 2.1 and 2.2 – using the *Donald J. Trump* prime in the context of both the *extended dictator game* as well the *"ABC of cooperation" public goods game* – and introduce the nudges at the decision stage as explained below.

## Attempting to Reduce Polarization Using a Default Nudge

### *3.3.1. Data Collection and Experimental Design*

- **In the Extended Dictator Game:** at the stage where participants were asked to make a give-or-take decision towards the matched partner, the option "give $2.5" was pre-selected (in the original version of the experiment, no option was pre-selected). This pre-selected option corresponds to 50% of the amount that can be given to the

[25] Hummel and Maedche (2019) found that the default nudge far outperforms alternative interventions (e.g., reminders, norm-nudges etc.), yielding an uncontested average effect size of 87% and median effect size of 50%. For norm-information nudges, these numbers are 29% and 20%, respectively. See also Benartzi et al., 2017; Bicchieri and Dimant, 2019; Jachimowicz et al., 2019; Beshears and Kosowsky, 2020.

partner and, most importantly, is the only choice that achieves an equal split between dictator and recipient.[26] A participant was then given the chance to actively override the default or simply proceed to the next screen (demographic questionnaire) upon which the default was implemented.

- **In the Extended ABC Public Goods Game:** at the decision stages where attitudes ($a_{\mathrm{i}}$), the default nudge pre-selected the response of a conditional cooperator. That is, for each question of the strategy method elicitation ("What would you contribute if your partner contributed \$0, \$1 ... \$10?") the directly-corresponding conditionally cooperative response (\$0, \$1 ... \$10) was pre-selected.[27] For the elicitation of beliefs ($b_{\mathrm{i}}$) and the effective contribution ($c_{\mathrm{i}}$), the default nudge pre-selected the welfare-maximizing option (\$10). Participant were able to override any of these pre-selections or continue to the next screen upon which the default was implemented.

In what follows, I will present the results for the two experiments separately. To foreshadow what to expect: the default nudge does *not* yield the expected success. While it has a measurable impact on *aggregate levels* and is successful in narrowing some of the original gaps, the overall insight is sobering in that a default nudge alone is not able to alleviate the detrimental impact of polarization in the contexts studied here.

### *3.3.2. Results: Effectiveness of the Default Nudge in the Extended Dictator Game*

As evident in Figure 8, the success of the default nudge is nuanced. Compared to the results from Experiment 1 (see top-right of Figure 2 and upper panel of Figure 3), the default increases altruism at the aggregate level: taking behavior towards the outgroup is reduced from about 20% to essentially 0% of the initial endowment and giving behavior to the ingroup from about 10-15% to about 25-35% of the initial endowment.

However, the results also emphasize the limits of the default nudge intervention: the ingroup-outgroup polarization remains at comparable levels in terms of both effect sizes and statistical significance. One can observe the same robust result when breaking up the analysis according to the participant's opinion about Trump (see right panel of Figure 8 and Figure OA.20 in the Online Appendix).

[26] Recall that, following List (2007), all variants of the game with an initial split of \$10 and \$5 between dictator and recipient, respectively.

[27] Recall that in the original treatments, no option was pre-selected and participants were able to choose any number between \$0 and \$10 for each of the possible decisions of the partner from a drop-down menu.

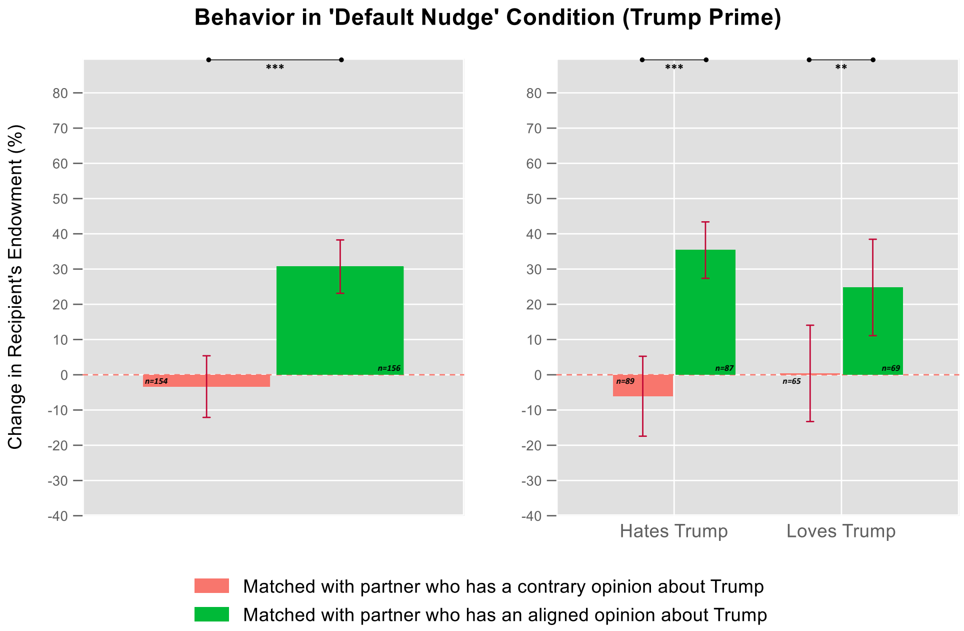


**Figure 8:** Left Panel: Behavior broken down by whether one is matched with a partner who either has aligned or contrary opinions. Right Panel: same but broken down by one's own opinion about Trump. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

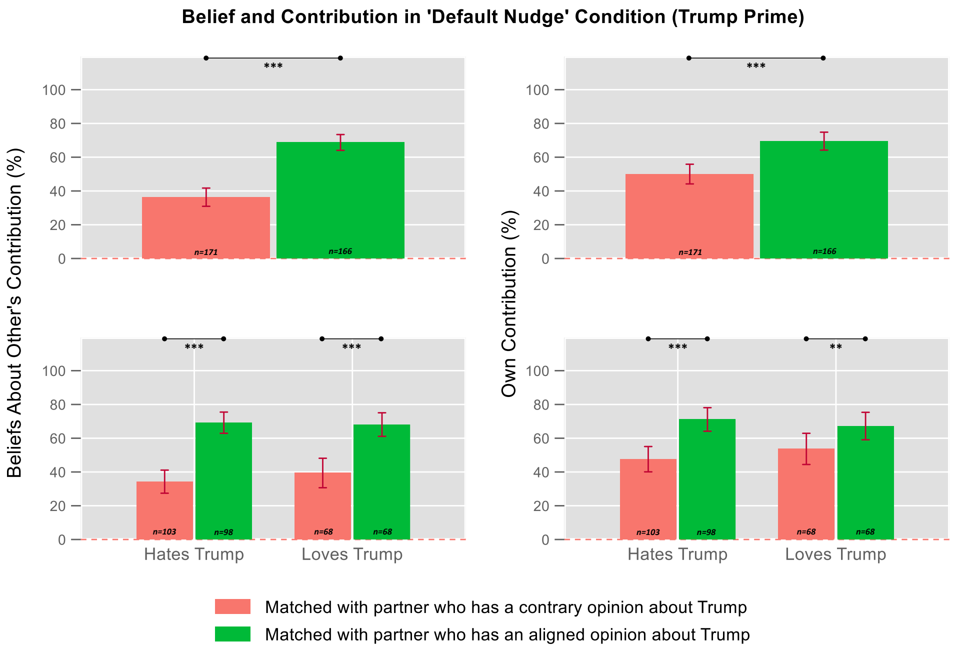


**Figure 9:** Left Panel: Beliefs and behavior broken down by whether one is matched with a partner who either has aligned or contrary opinions. Right Panel: same but broken down by one's own opinion about Trump. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

### *3.3.3. Results: Effectiveness of the Default Nudge in the Public Goods Game*

Following the original analysis (presented in Figures 5 and 6), Figure 9 (also see Figure OA.21 in the Online Appendix) presents one's beliefs about the matched partner's contribution ($b_\mathrm{i}$) and one's actual contribution ($c_\mathrm{i}$) in the PGG in the presence of the nudge.[28]

The results are consistent with those presented above in that the introduced nudge is rather ineffective in achieving the principal goal of reducing polarization: the ingroup-outgroup differences remain similar to those observed in the original experiment where the nudge was absent, both in terms of effect sizes and statistical significance.

### Attempting to Reduce Polarization Using a Descriptive Norms Nudge

The concept of norm-nudging has been popularized across various fields of social sciences and has been widely applied in the context of behavior change(for a theoretical conceptualization see Bicchieri and Dimant, 2019). These interventions attempt to change behavior by eliciting and changing existing social norms through the manipulation of social expectations. In the two set of experiments explained below, I harness one particular aspect of norm-nudging – descriptive norms – which informs participants in this experiment truthfully of the behavior previous participants. In particular, I emphasize the pro-social and cooperative nature of previous participants with the goal to change these participants' beliefs of what is commonly done in this situation (for similar applications in other contexts see Hallsworth et al., 2017; Damgaard and Gravert, 2018; Allcott and Kessler, 2019; Bott et al., 2019; Bursztyn et al., 2020a,b; Dimant et al., 2020; Dimant and Gesche, 2020).

- **In the Extended Dictator Game:** the protocol of this experiment was identical to that described in Section 2.1 with one additional piece of information. Participants were given the truthful message (as illustrated in Figure OA.24) that many participants have been very benevolent towards other participants and gave them enough money ($2.5) to achieve an equal split in endowments in previous sessions of this game, even if they had a contrary opinion about Trump.
- **In the Extended ABC Public Goods Game:** similarly, the protocol of this experiment was identical to that described in Section 2.2 with one additional piece of information. Participants were given the truthful message (as illustrated in Figure OA.27) that many participants have been very cooperative with other participants in previous sessions of this game, even if they had a contrary opinion about Trump.

[28] For attitudes ($a_\mathrm{i}$) see Figure OA.22 in the Online Appendix.

### *3.3.4. Results: Effectiveness of the Information Nudge in the Extended Dictator Game*

As is the case for the default nudge intervention discussed above, the results of the information nudge intervention are similarly bleak: as illustrated in Figure 10 (also see Figure OA.23 in the Online Appendix), this intervention is unable to reduce the originally observed polarization in the context of the extended DG. This holds true even when breaking up the results by the participant's own Trump preference (right panel). Noteworthy, some success can be noted with respect to reducing anti-social behavior towards outgroups, which is limited to those participants who indicated to hate Trump. Conversely, the outgroup animosities of those who love Trump remain unaffected and their magnitude is comparable to that reported in the original experiment (Section 2.1). However, this should not distract from the overall ineffectiveness of this intervention to achieve the goal of reducing polarization in a non-strategic setting.

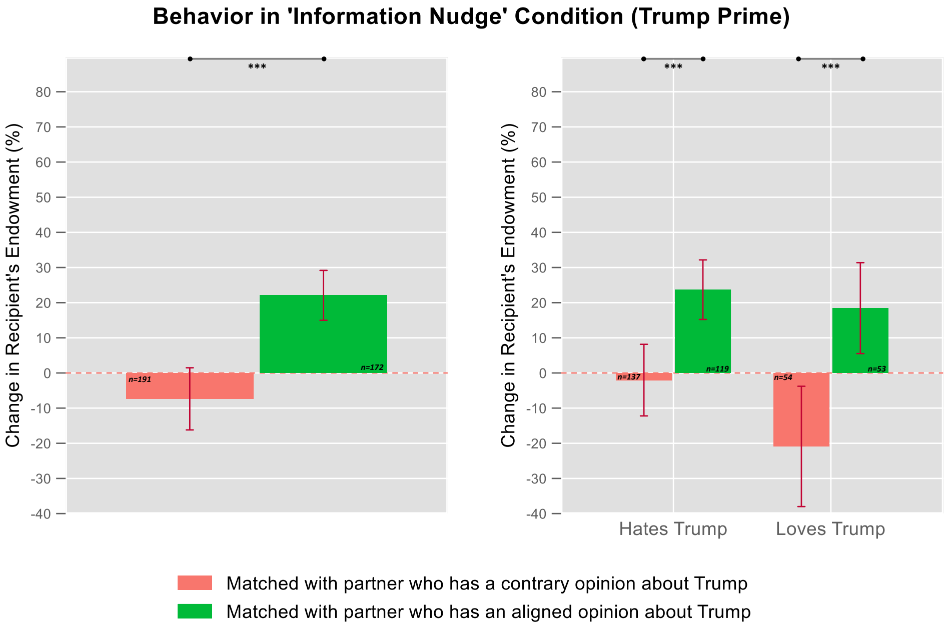


**Figure 10:** Left Panel: Behavior broken down by whether one is matched with a partner who either has aligned or contrary opinions. Right Panel: same but broken down by one's own opinion about Trump. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

### *3.3.5. Results: Effectiveness of the Information Nudge in the Public Goods Game*

Consistent with the results above, the effectiveness of the information nudge intervention aimed at reducing the polarization gap in the Public Goods Game is quite limited, too: as illustrated in Figure 11 (see also Figure OA.25 in the Online Appendix), the persistence of affective polarization is vivid, both for beliefs about the partner's contribution and one's own contribution. This result holds true even when breaking up the data by one's own opinion about Trump and is not driven by one particular subgroup.[29] Overall, the magnitude of the persistent polarization gap following the norm-intervention is comparable to the original study (Section 2.2) absent any intervention.

The take-away message is that the attempt of nudging away affective polarization through means of changing norm-relevant beliefs is insufficient, both in a strategic but, as shown above, also in a non-strategic setting. While simple behavior interventions have proven very successful in other settings, the experiments discussed here emphasize that polarization runs deep and needs institutional, rather than only behavioral interventions.

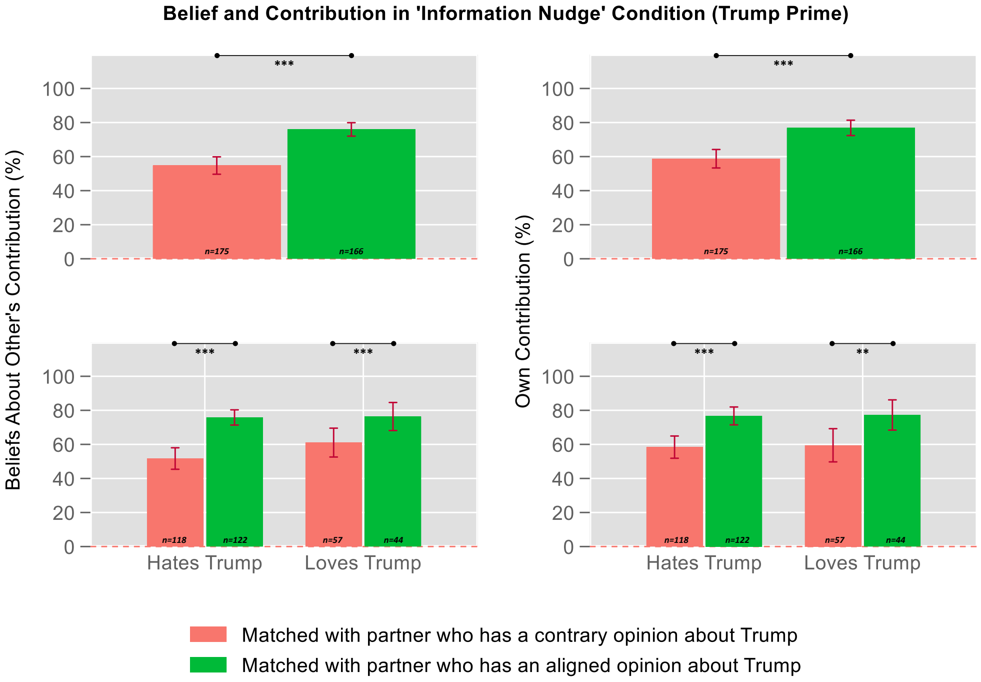


**Figure 11:** Left Panel: Beliefs and behavior broken down by whether one is matched with a partner who either has aligned or contrary opinions. Right Panel: same but broken down by one's own opinion about Trump. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values $> 0.05$.

[29] As illustrated in Figure OA.26, there is some indication that those participants who indicated to hate Trump make an ingroup/outgroup differentiation with respect to the extent to which they free-ride and how conditionally cooperative they are. The same cannot be observed for those who indicated to love Trump.

## 4. Conclusion and Discussion

I examine the impact of affective polarization on behaviors, beliefs, and norms through the lens of three experiments of both strategic and non-strategic nature. This paper is concerned with the extent to which polarization succeeds in affecting pro- and anti-social behavior, cooperativeness, and the perception of social norms with respect to these behaviors. I embed polarization by capitalizing on participants' negative/positive opinions about Donald J. Trump and compare the outcomes to those observed in treatments using the standard minimal identity paradigm to disentangle ingroup-love from outgroup-hate.

Along all investigated dimensions, I obtain strong effects and the following results: for one, polarization produces ingroup/outgroup differentiation in all studied settings, leading participants to actively harm and cooperate less with participants from the opposing faction. For another, lack of cooperation is not the result of a categorical unwillingness to cooperate across factions, but based on one's grim expectations about the other's willingness to cooperate. Importantly, however, the results also cast light on the nuance with which ingroup-love and outgroup-hate – something that existing literature often takes as being two sides of the same coin – occurs. In particular, by comparing behavior between the Trump Prime and minimal group prime treatments, the results suggest that ingroup-love can be observed in terms of feeling close to one another, whereas outgroup hate appears in form of taking money away from and being less cooperative with each other. The elicited norms are consistent with these observations and also point out that those who love Trump have a much weaker ingroup/outgroup differentiation than those who hate Trump do. On top of that, through additional experiments I find that the observed behavioral and perceptional effects that are caused by affective polarization are not limited to Donald Trump but also carry over to Joe Biden, which indicates a larger ideological rift in the U.S. society. In a final set of experiments, I attempt to reduce the negative consequences of polarization using established behavioral interventions that utilize the concept of nudging.

With that, the paper speaks to the effects of polarization and helps to understand how behavior changes in response to it. I provide evidence for how exacerbated the intergroup animosities currently are, especially in the U.S., but which are also symptomatic of a global societal rift (Baldassarri and Bearman, 2007; Carothers and O'Donohue, 2019). From a policy perspective, the findings in this paper contribute to the affective polarization insights: correcting misguided beliefs can help to avoid harmful spillovers and intergroup animosities, bridge the 'dehumanization' divide – the misconception of how negatively we think others see us – and also address *negativity bias*, one's inaccurate first- and second-order beliefs about the outgroup's behaviors, intentions, and perception of us (Levendusky and Malhotra, 2016; Flynn et al., 2017; Lees and Cikara, 2020; Moore-Berg et al., 2020). This is particularly important since people are found to preferentially consume and engage with information that aligns with their prior beliefs, which can aggravate the partisan rift (Dorison et al., 2019; Shi et al., 2019; Levy, 2020; Schwalbe et al., 2020). At the same time, the ineffectiveness of behavioral interventions to close the polarization gap suggests that structural, on top of behavioral changes are needed to heal the society.

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# Main Appendix

## Appendix A. Additional Results Using Trump Primes (Section 2.1, T-o-G Dictator Game) & Experiment 2 (Section 2.2, ABC of Cooperation)

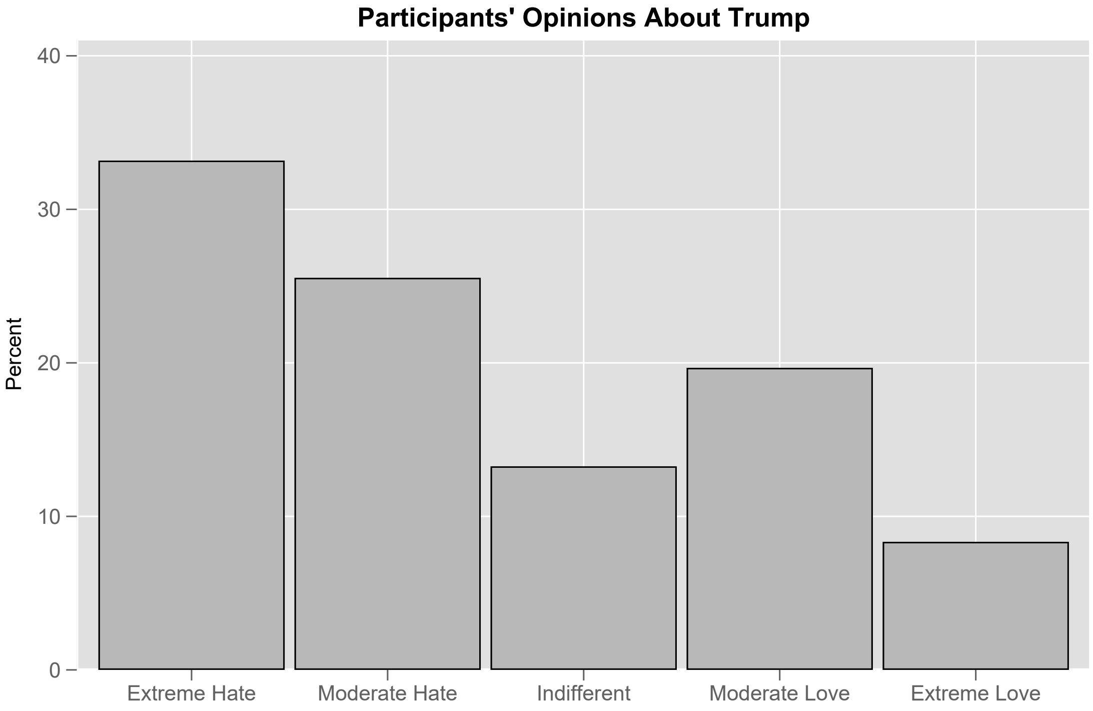


**Figure A.1:** Histogram of Trump opinions for both TP and MGP treatments.

**Table A.1:** OLS Regression Analysis of T-o-G Dictator Game Behavior

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---|---|---|---|---|---|---|
| Matched with Aligned | 38.491*** | 31.762*** | 32.752*** | | | |
| Trump Preference | (5.593) | (6.537) | (6.927) | | | |
| Closeness Score (%) | | 0.176* | 0.182* | | 0.222*** | 0.244*** |
| | | (0.091) | (0.098) | | (0.078) | (0.081) |
| Loves Trump | | | | -32.514*** | -23.298** | -17.790* |
| | | | | (8.837) | (9.316) | (10.428) |
| Matched with Unknown | | | | -15.075** | -7.334 | -5.913 |
| | | | | (6.551) | (6.999) | (7.127) |
| Matched with Trump Lover | | | | -36.979*** | -28.519*** | -29.041*** |
| | | | | (6.876) | (7.423) | (7.599) |
| Loves Trump × | | | | 53.546*** | 44.381*** | 43.285*** |
| Matched with Unknown | | | | (12.054) | (12.269) | (12.441) |
| Loves Trump × | | | | 78.557*** | 61.561*** | 58.618*** |
| Matched with Trump Lover | | | | (11.819) | (13.191) | (13.500) |
| Constant | -23.514*** | -30.548*** | -35.416 | 12.083*** | -5.472 | -31.785 |
| | (4.398) | (5.623) | (36.886) | (4.302) | (7.286) | (30.163) |
| Controls | No | No | Yes | No | No | Yes |
| Observations | 423 | 423 | 416 | 598 | 598 | 586 |

DV: Dictator game behavior (neg. = taking; pos. = giving). Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

**Table A.2:** OLS Regression Analysis of PGG Contribution Behavior

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---|---|---|---|---|---|---|
| Matched with Aligned | 13.427*** | 4.355 | 5.281 | | | |
| Trump Preference | (3.815) | (4.412) | (4.506) | | | |
| Closeness Score (%) | | 0.250*** | 0.196*** | | 0.217*** | 0.156*** |
| | | (0.064) | (0.065) | | (0.053) | (0.054) |
| Loves Trump | | | | -10.873** | -3.703 | -8.452 |
| | | | | (5.336) | (5.392) | (6.307) |
| Matched with Unknown | | | | -7.643 | -1.019 | -4.873 |
| | | | | (4.870) | (5.081) | (5.175) |
| Matched with Trump Lover | | | | -17.200*** | -8.490 | -10.530* |
| | | | | (4.974) | (5.453) | (5.490) |
| Loves Trump × | | | | 22.953*** | 12.896* | 14.058* |
| Matched with Unknown | | | | (7.593) | (7.751) | (7.897) |
| Loves Trump × | | | | 23.904*** | 8.696 | 10.640 |
| Matched with Trump Lover | | | | (7.662) | (8.359) | (8.216) |
| Constant | 51.029*** | 39.658*** | -40.529** | 65.748*** | 47.743*** | -11.477 |
| | (2.805) | (4.132) | (16.652) | (3.287) | (5.711) | (13.972) |
| Controls | No | No | Yes | No | No | Yes |
| Observations | 388 | 388 | 373 | 537 | 537 | 519 |

Dependent variable is a participants contribution (%) to the PGG. Robust standard errors in parentheses.

$^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$.

## Appendix B. Trump Prime: Social Norms in (Non-)Strategic Contexts

### *Appendix B.1. Results for the T-o-G Dictator Game*

In this section, the results from the dictator game, as discussed in Section 2.1.3 (especially in Figures 2 and 3), will be analyzed through the lens of a norm elicitation that follows the method of Krupka and Weber (2013).[30]

The first set of results is presented in Figure A.2 and paints a picture that is extremely consistent with both the observed closeness and dictator behavior behavior, as illustrated in Figure 2: when matched with a partner who has an **aligned** opinion about Trump, taking from (giving to) that partner is perceived as more inappropriate (more appropriate) compared to when matched with a partner who has a **misaligned** opinion about Trump (all differences significant at p<0.001 using BSM tests).

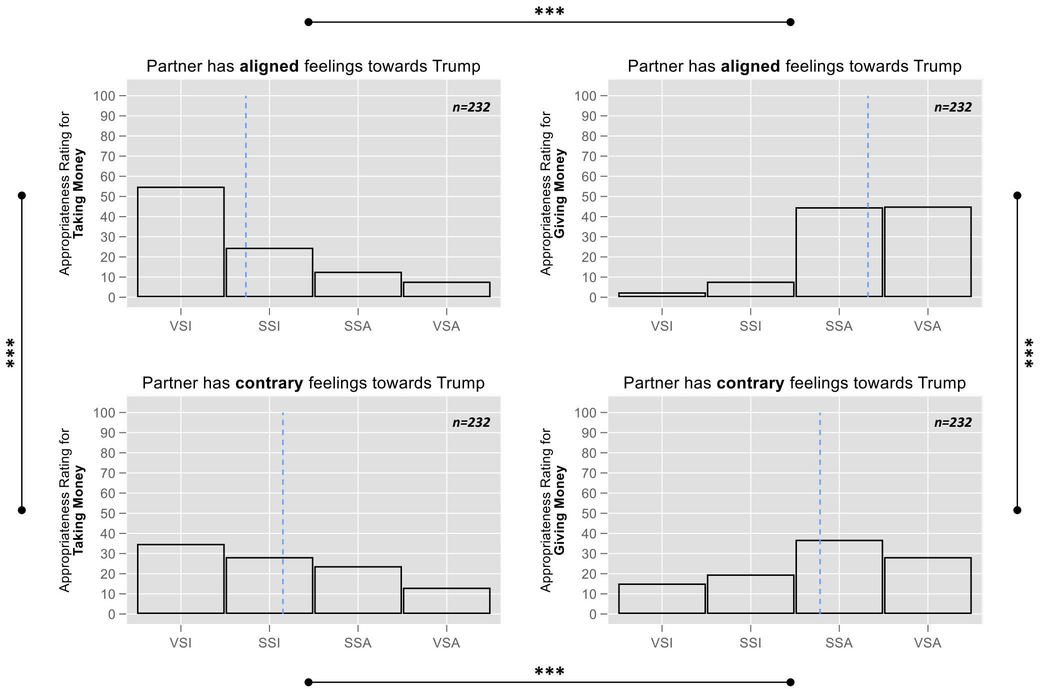


**Figure A.2:** Norm perceptions for taking and giving money with partners who have aligned or contrary feelings towards Trump. All adjacent quadrants are tested and statistical significance (if either ***p<0.01 or **p<0.05) is indicated where applicable. *Very Socially Inappropriate* (VSI), *Somewhat Socially Inappropriate* (SSI), *Somewhat Socially Appropriate* (SSA), and *Very Socially Appropriate* (VSA).

[30] Consistent with the previous analyses, the main focus remains the behavior towards partners with the same or contrary opinion of Trump. In the Online Appendix, I present analyses that include perceptions when matched with a partner for whom the opinion about Trump remains undisclosed.

These insights complement the results from Figure 2 and suggest that the observed differences in feeling of closeness and pro-sociality towards a partner who has an aligned opinion about Trump go hand in hand with the norm perception that this is indeed the right thing to do, whereas it is perceived to be more appropriate to harm someone with a contrary opinion about Trump.

Next, following the previous analyses in Figure 3, I analyze the norm perceptions conditional on one's own opinion about Trump and present the results separately for taking behavior (top of Figure A.3) and giving behavior (bottom of Figure A.3). As before, the norm elicitations are consistent with the observed closeness and dictator game behaviors.

For taking behavior, those who identified as *Trump haters* indicate that it is more acceptable to take from a *Trump-lover* (TH-TL) than from a fellow *Trump-hater* (TH-TH), which is highly statistically significant (BSM, p<0.001). Conversely, I do not observe the same difference for those who identified as *Trump lovers* (BSM, p=0.81), which is primarily driven by the fact that those who are matched with their own kind have a substantially higher approval for taking money from their partner than Trump haters have when matched with their own kind (comparing TL-TL vs. TH-TH, BSM, p<0.001).

Consistent with the theme of this paper, these results indicate that hate evokes stronger norms against harming each other and, additionally, those who love Trump do not distinguish between ingroup-love and outgroup-hate with respect to harming others.

In terms of giving behavior, one can observe that being matched with a participant with the same preference for Trump leads to a significantly higher appropriateness rating compared to giving to a participant with a misaligned opinion of Trump (comparing TH-TH vs. TH-TL and TL-TL vs. TL-TH, BSM, both p-vales <0.001). In addition, consistent with the previous results, joint hate for Trump evokes a stronger bond in the form of appropriateness for giving than joint love (comparing TH-TH vs. TL-TL, BSM, p=0.0199).

Taken together, one can conclude that the perceived social norms map convincingly onto the observed T-o-G dictator game behavior and can explain the observed behavioral differences between Trump haters and Trump lovers as well as their perceptions and attitudes towards people with aligned and misaligned opinions about Donald J. Trump.

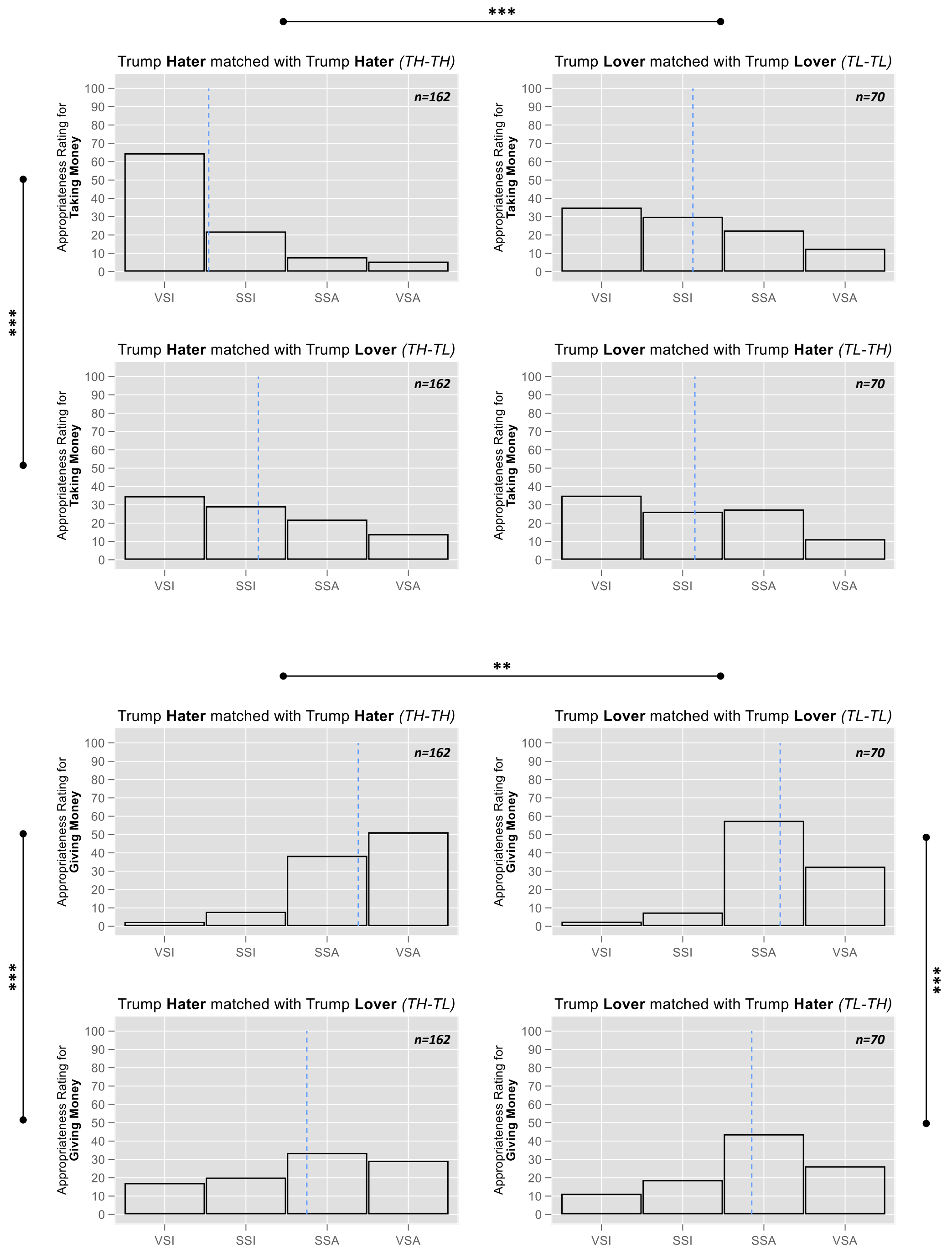


**Figure A.3:** Norm perceptions for taking and giving money conditional on own and matched partner's Trump opinion. All adjacent quadrants are tested and statistical significance (if either ***p<0.01 or **p<0.05) is indicated where applicable. *Very Socially Inappropriate* (VSI), *Somewhat Socially Inappropriate* (SSI), *Somewhat Socially Appropriate* (SSA), and *Very Socially Appropriate* (VSA).

*Appendix B.2. Results for the Public Goods Game*

Following the previous analyses, this section reports the norm perceptions across various possible behaviors in the PGG (free-riding and full cooperation) for the different treatments and reported Trump preferences.[31] These behaviors are defined as followed: **free-riding** refers to the decision to benefit from the public good by contributing nothing, even though one's matched partner contributes a non-zero amount. **Full cooperation** refers to the decision to contribute the full amount regardless of the partner's behavior. The results presented in Figure A.4 paint a clear picture: participants perceive it as *more* socially appropriate to free-ride on a partner who has a contrary opinion about Trump, but less socially appropriate to fully cooperate with the same partner (both p<0.01).

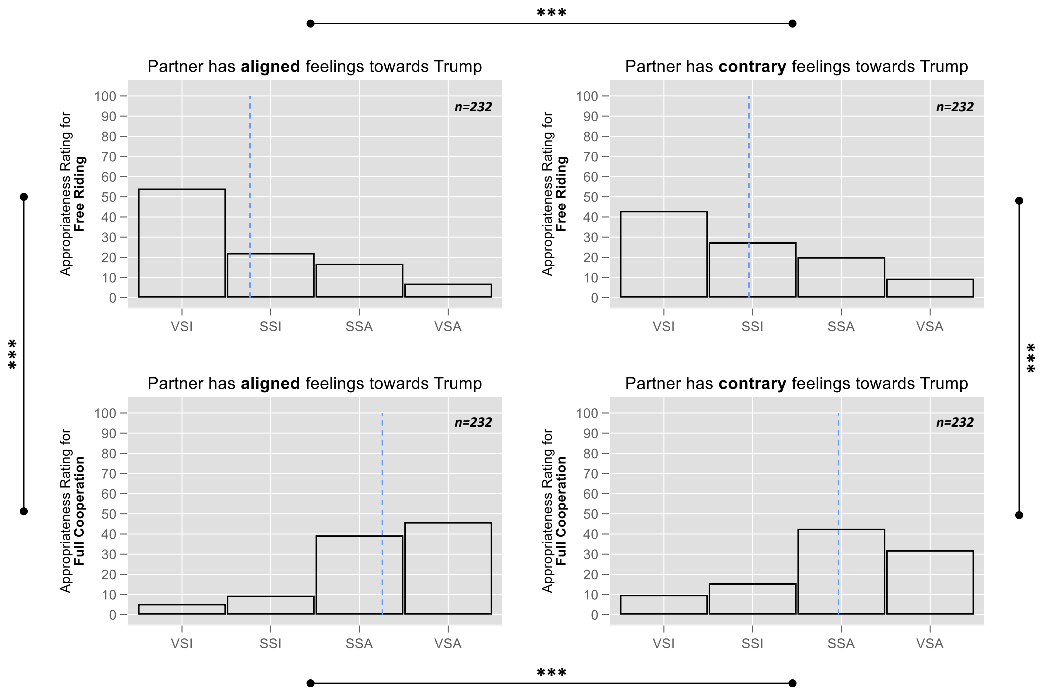


**Figure A.4:** Norm perceptions for free riding and full cooperation with partners who have aligned or contrary feelings towards Trump. All adjacent quadrants are tested and statistical significance (if either ***p<0.01 or **p<0.05) is indicated where applicable. *Very Socially Inappropriate* (VSI), *Somewhat Socially Inappropriate* (SSI), *Somewhat Socially Appropriate* (SSA), and *Very Socially Appropriate* (VSA).

In addition, one can observe in Figure A.5 that the previous results very much depend on

[31] In the Online Appendix, I also present the norm elicitations for two other behaviors: *Contribute Nothing* and *Conditional Cooperator*.

one's stated preference towards Trump: the previously mentioned differential perception of appropriateness for *free-riding* is entirely driven by Trump haters (p<0.001), whereas there is no significant difference for Trump lovers (p=0.47). The same is true for full cooperation (bottom of Figure A.5): Trump haters perceive it as more socially appropriate to fully cooperate with a partner who has an aligned Trump opinion (p<0.001). Again, Trump lovers do not make a distinction irrespective of whom they are matched with (p=0.72). This maps well onto the result presented in Figure 6 (top-right panel) in that only Trump haters make an ingroup-outgroup differentiation in their level of contribution.

Noteworthy, these findings are consistent with the results discussed in Section 2.2.3 in that Trump haters show a clear ingroup-love/outgroup-hate distinction, whereas Trump lovers do not seem to make this distinction and treat either participant in the same way. It is important to note that although Trump lovers do not discriminate between their matched partners, they perceive it as much more socially appropriate to free-ride on their partner than Trump haters do (p<0.001, not illustrated).

From a big picture perspective, the findings are in harmony with the existing social norms research and can be subsumed under the umbrella of *conditional norm followers* (Bicchieri, 2006; Bicchieri et al., 2020b): people display a preference for cooperation that is conditional on *empirical expectations* (beliefs about the matched partner's behavior, as measured in Experiment 2.2) and *normative expectations* (as measured in this experiment using the method by Krupka and Weber, 2013). Combining both types of elicitations provides a comprehensive evaluation of beliefs, preferences, and behaviors.

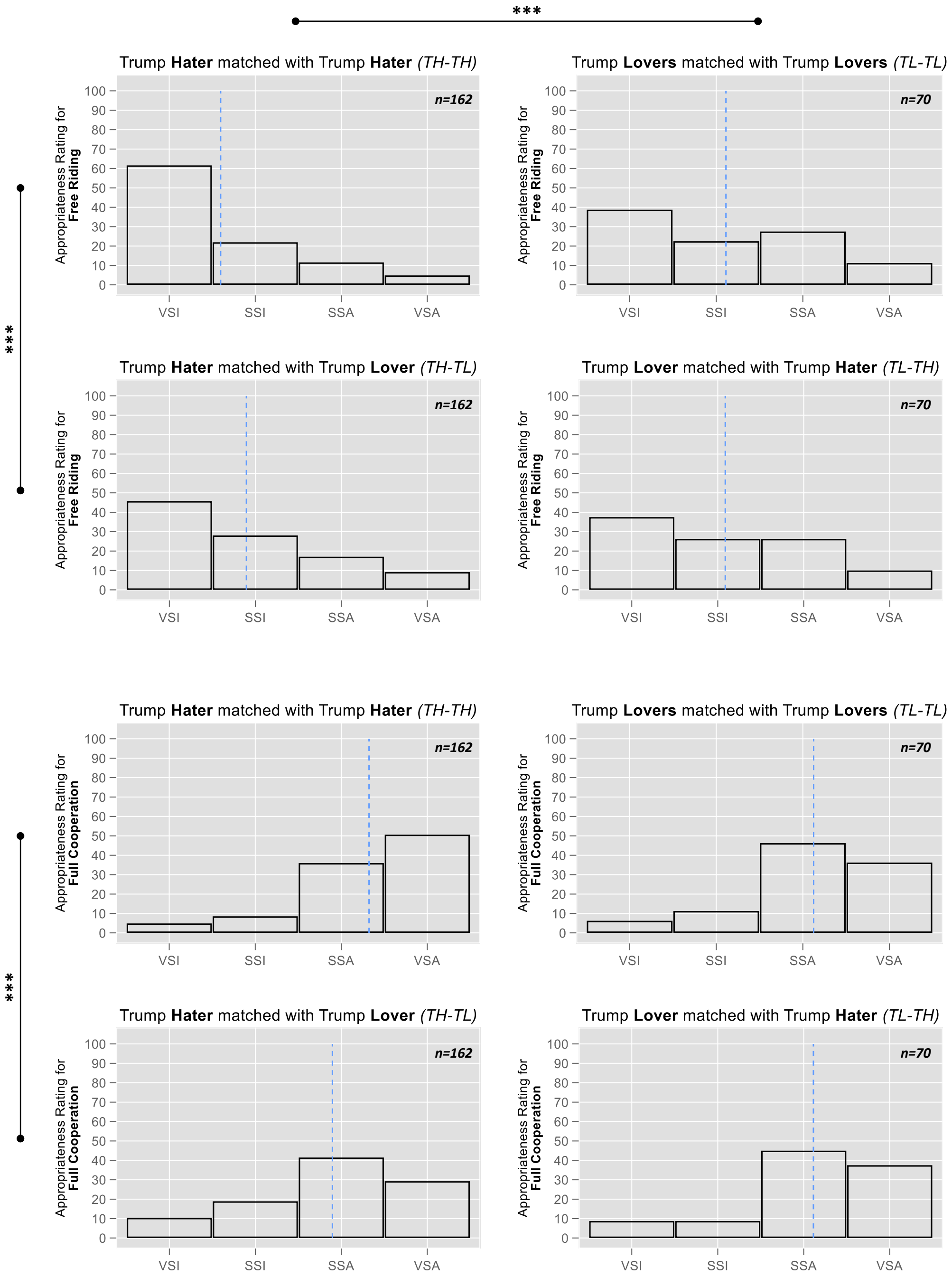


**Figure A.5:** Norm perceptions for free riding and full cooperation conditional on own and matched partner's Trump opinion. All adjacent quadrants are tested and statistical significance (if either ***p<0.01 or **p<0.05) is indicated where applicable. *Very Socially Inappropriate* (VSI), *Somewhat Socially Inappropriate* (SSI), *Somewhat Socially Appropriate* (SSA), and *Very Socially Appropriate* (VSA).

## Appendix C. Sports Prime

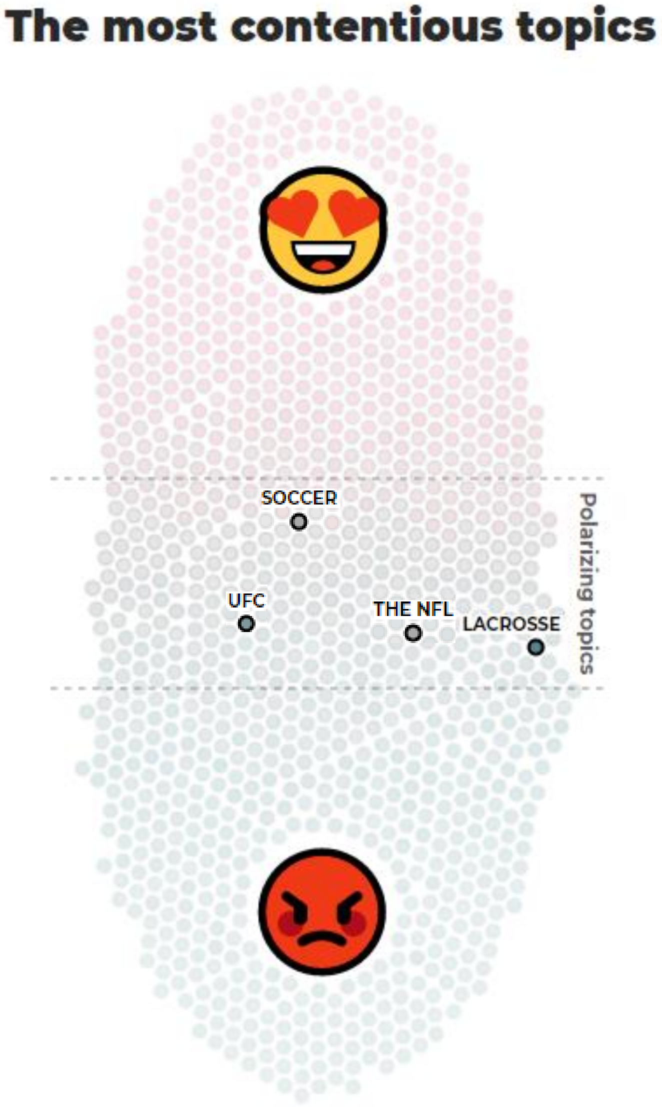


**Figure A.6:** Most contentious topics based on data from the dating app *Hater*.

# Online Appendix to “Hate Trumps Love: The Role of Political Polarization in Social Preferences”

Eugen Dimant

## Contents: Additional Results and Robustness

# I. Trump Prime – DG: Additional Results and Robustness Checks

## I.a. Main Experimental Conditions

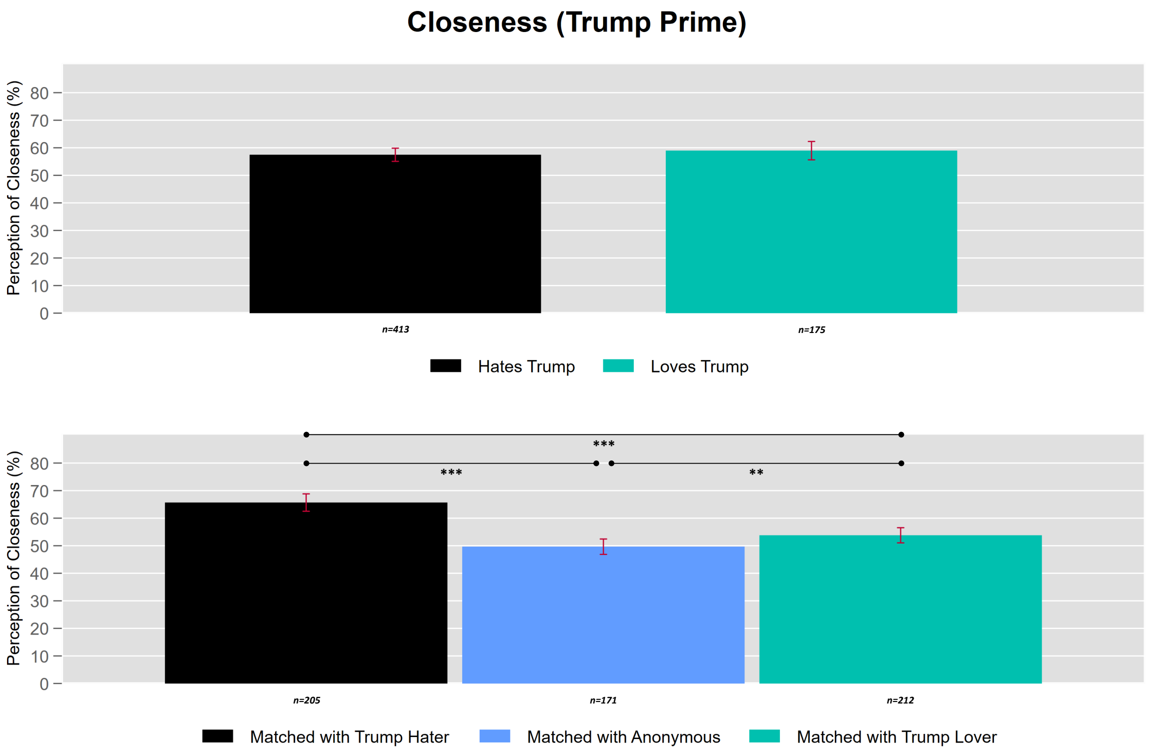


**Figure OA.1:** Closeness broken down by own opinion about Trump and being matched based on the partner's opinion about Trump. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values $> 0.05$.

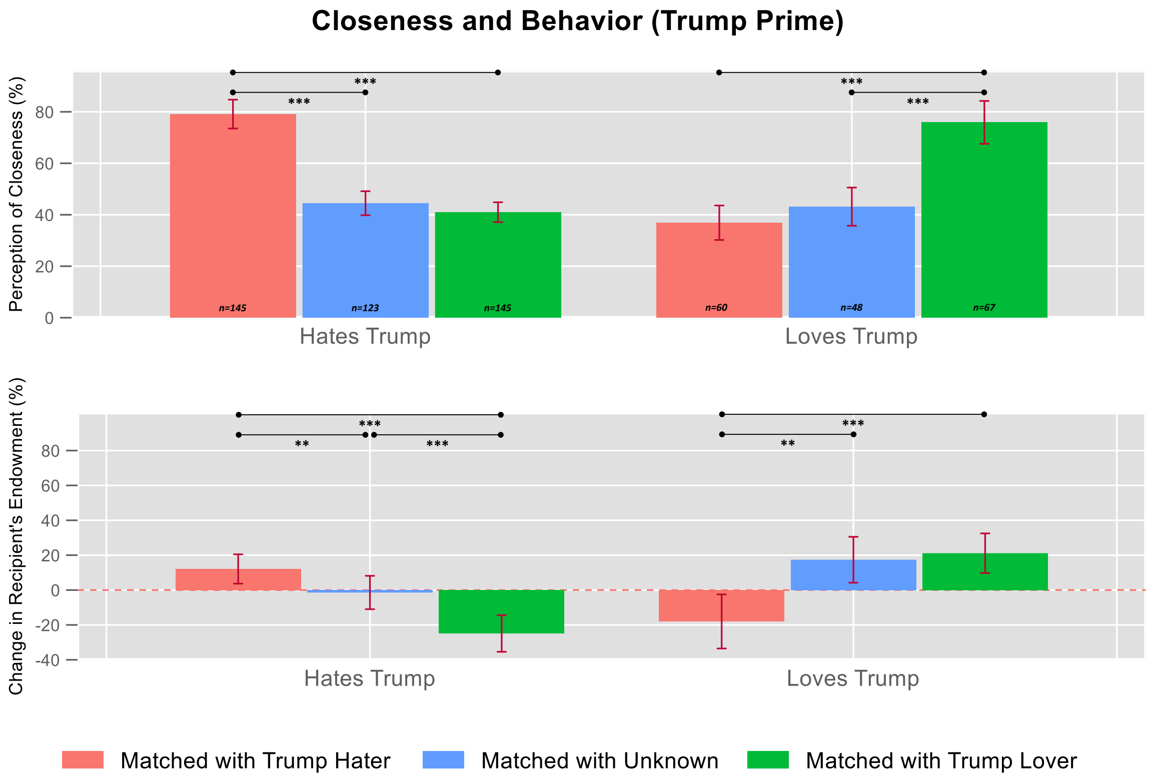


**Figure OA.2:** Closeness and behavior broken down by own opinion about Trump and being matched based on the partner's opinion about Trump. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

## I.b. Minimal Group Paradigm Conditions

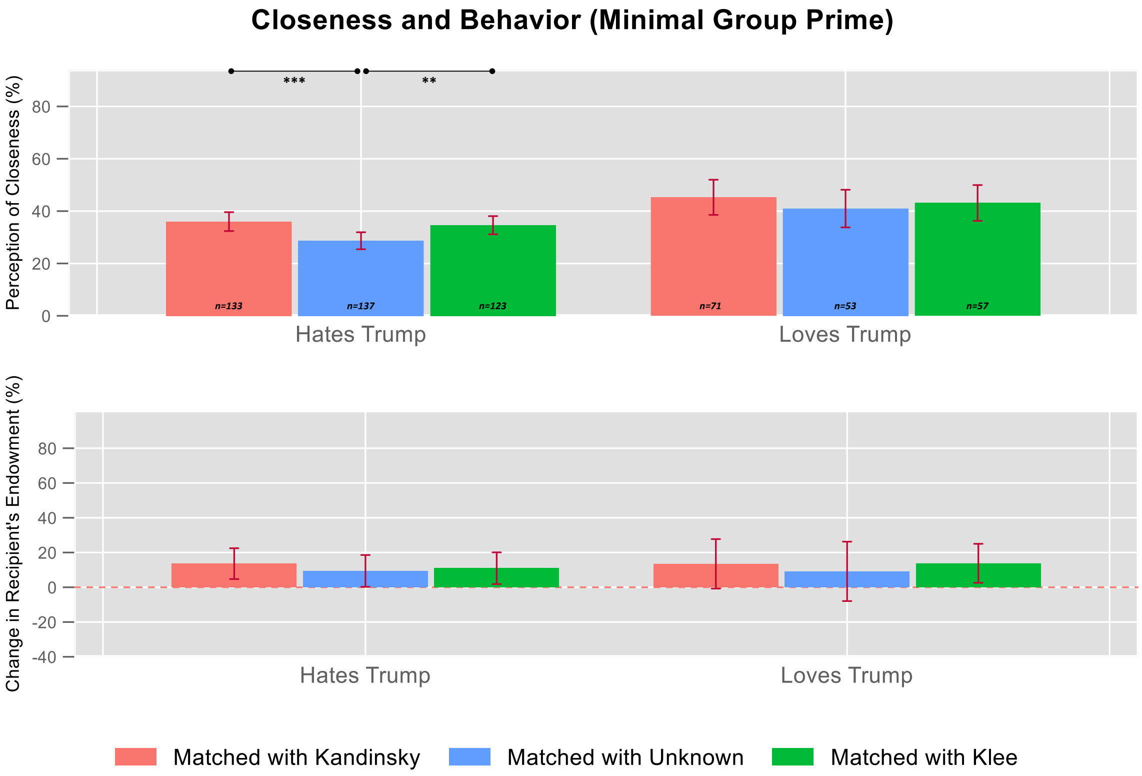
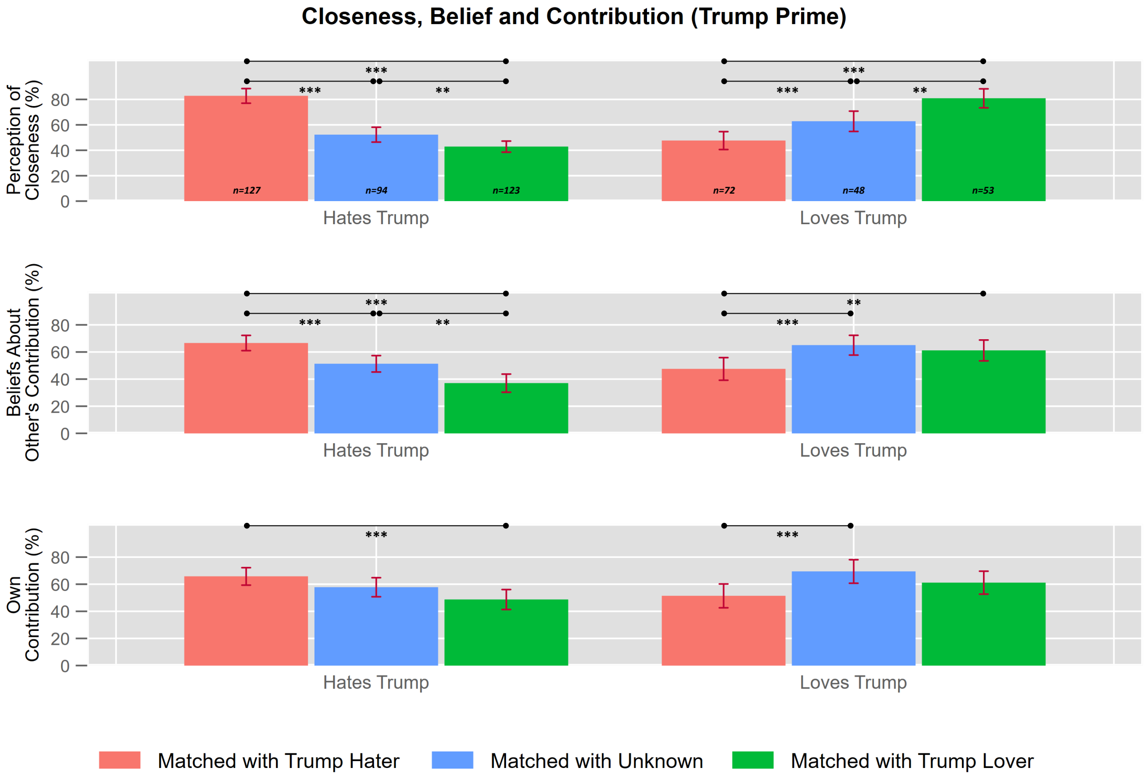


**Figure OA.3:** Closeness and behavior broken down by own opinion about Trump and being matched based the partner's painting preference. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

# II. Trump Prime – PGG: Additional Results and Robustness Checks

## Main Experimental Conditions



Closeness, Belief and Contribution (Trump Prime)

**Figure OA.4:** Closeness, belief, and behavior broken down by own opinion about and being matched based on the partner's opinion about Trump. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values $> 0.05$.

# III. Trump Prime – Norms: Additional Results and Robustness Checks

## III.a. Dictator Game

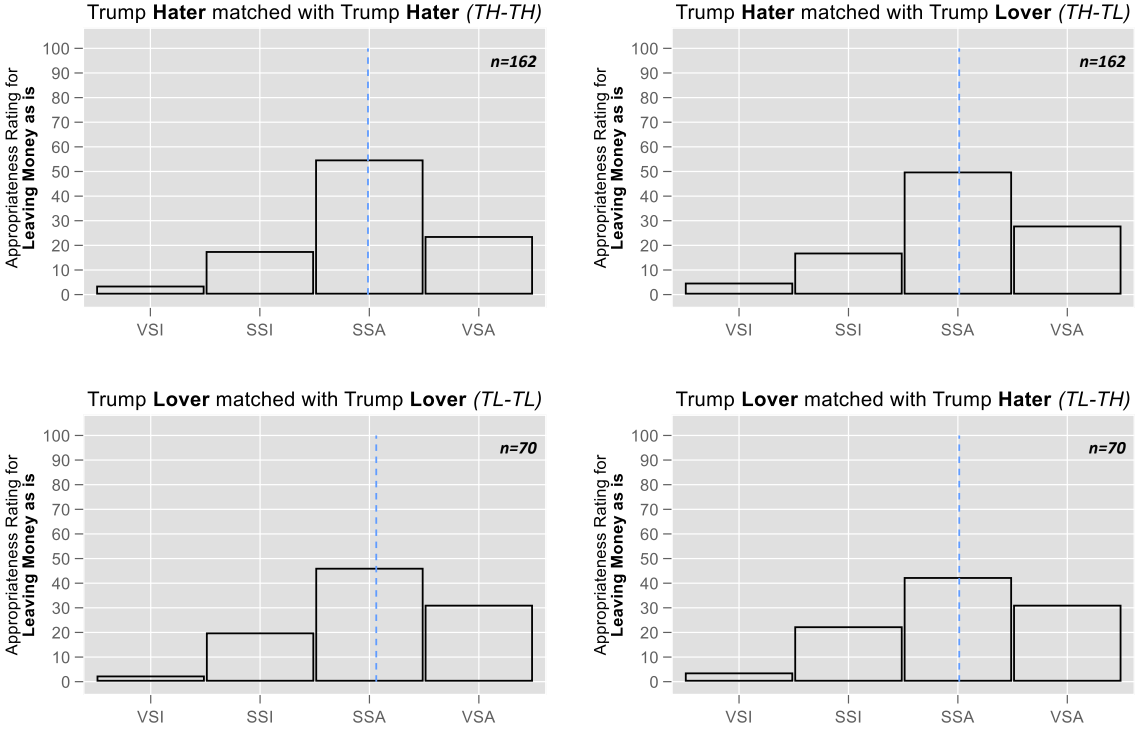


**Figure OA.5:** Norm perceptions for leaving initial split as is conditional on own and matched partner's Trump opinion. All adjacent quadrants are tested and statistical significance (if either ***p<0.01 or **p<0.05) is indicated where applicable. *Very Socially Inappropriate* (VSI), *Somewhat Socially Inappropriate* (SSI), *Somewhat Socially Appropriate* (SSA), and *Very Socially Appropriate* (VSA).

## III.b. Public Goods Game

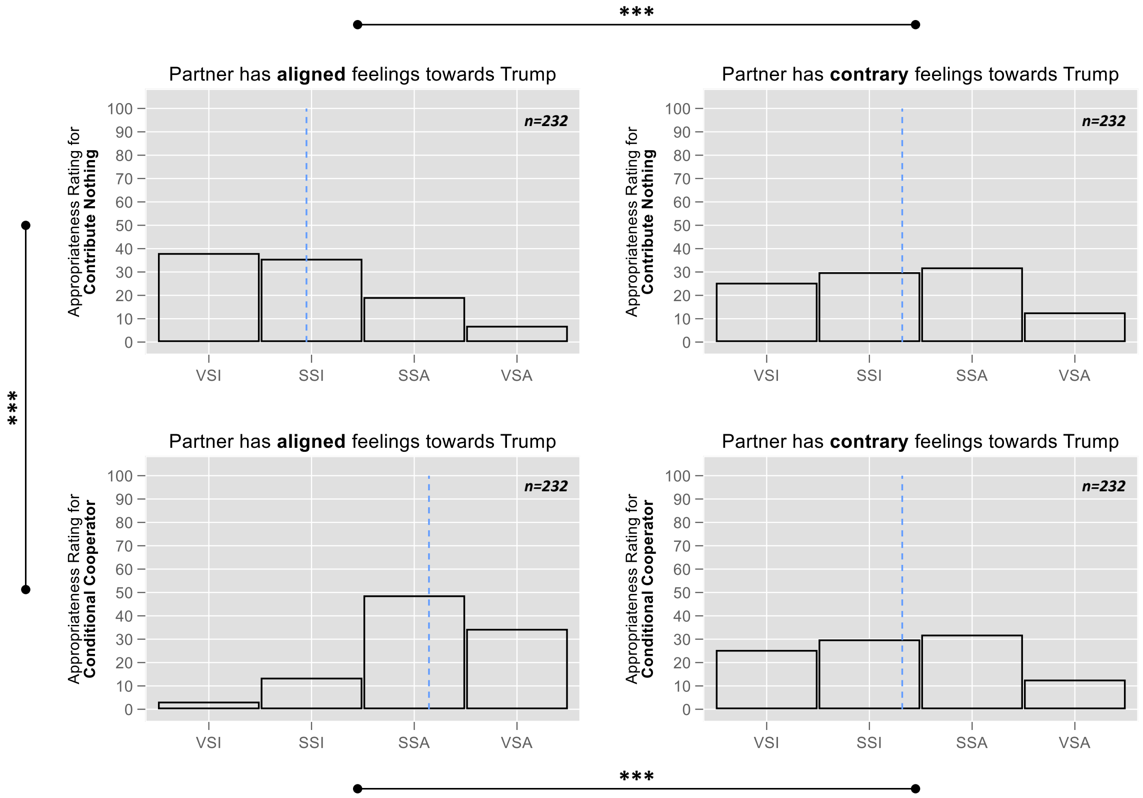


**Figure OA.6:** Norm perceptions for 'contribute nothing' Conditional Cooperators with partners who have aligned or contrary feelings towards Trump. All adjacent quadrants are tested and statistical significance (if either ***p<0.01 or **p<0.05) is indicated where applicable. *Very Socially Inappropriate* (VSI), *Somewhat Socially Inappropriate* (SSI), *Somewhat Socially Appropriate* (SSA), and *Very Socially Appropriate* (VSA).

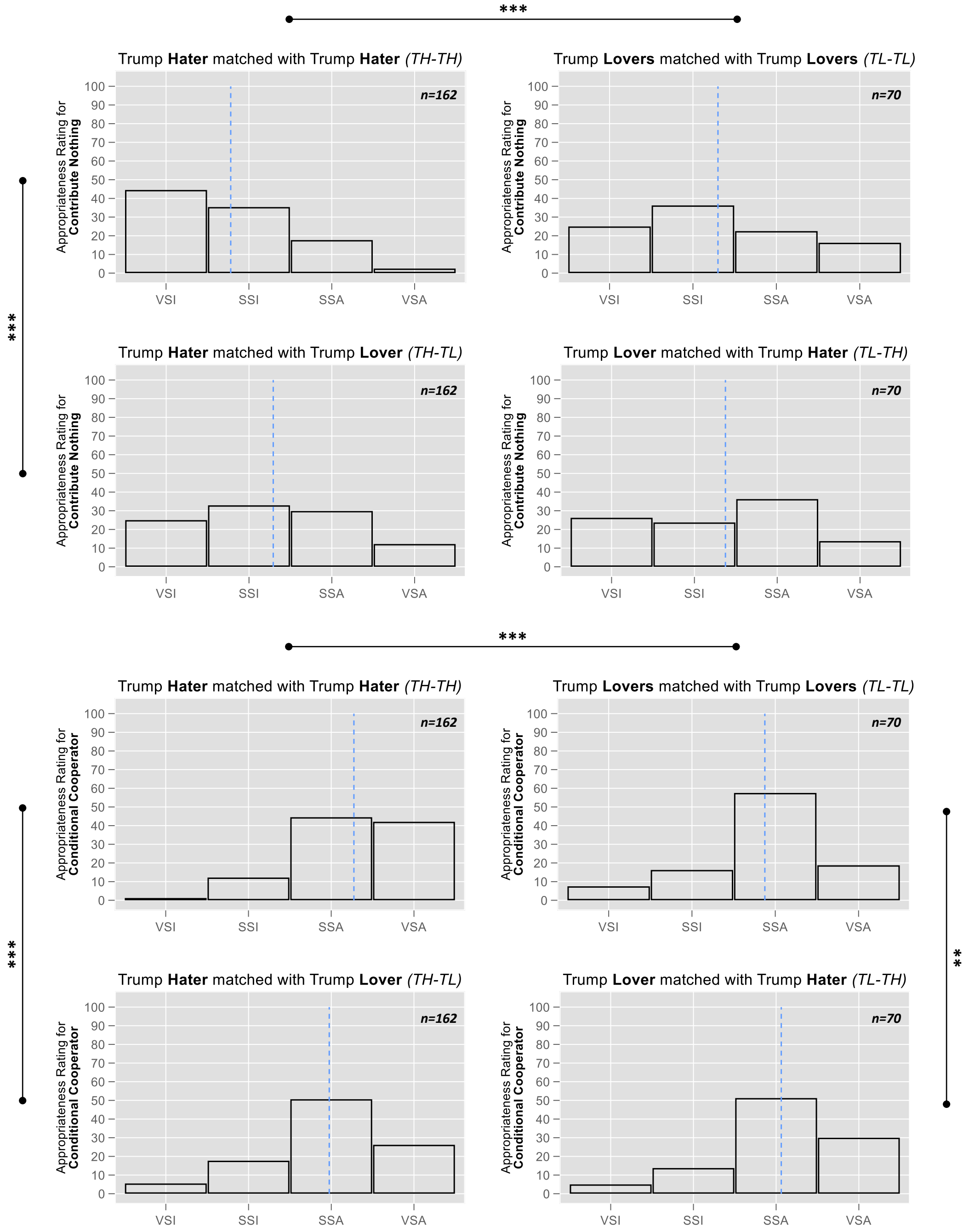


**Figure OA.7:** Norm perceptions for 'contribute nothing' Conditional Cooperators conditional on own and matched partner's Trump opinion. All adjacent quadrants are tested and statistical significance (if either ***p<0.01 or **p<0.05) is indicated where applicable. *Very Socially Inappropriate* (VSI), *Somewhat Socially Inappropriate* (SSI), *Somewhat Socially Appropriate* (SSA), and *Very Socially Appropriate* (VSA).

# IV. Biden and Sports Prime: Additional Results and Robustness Checks

## IV.a. Biden Prime – Dictator Game

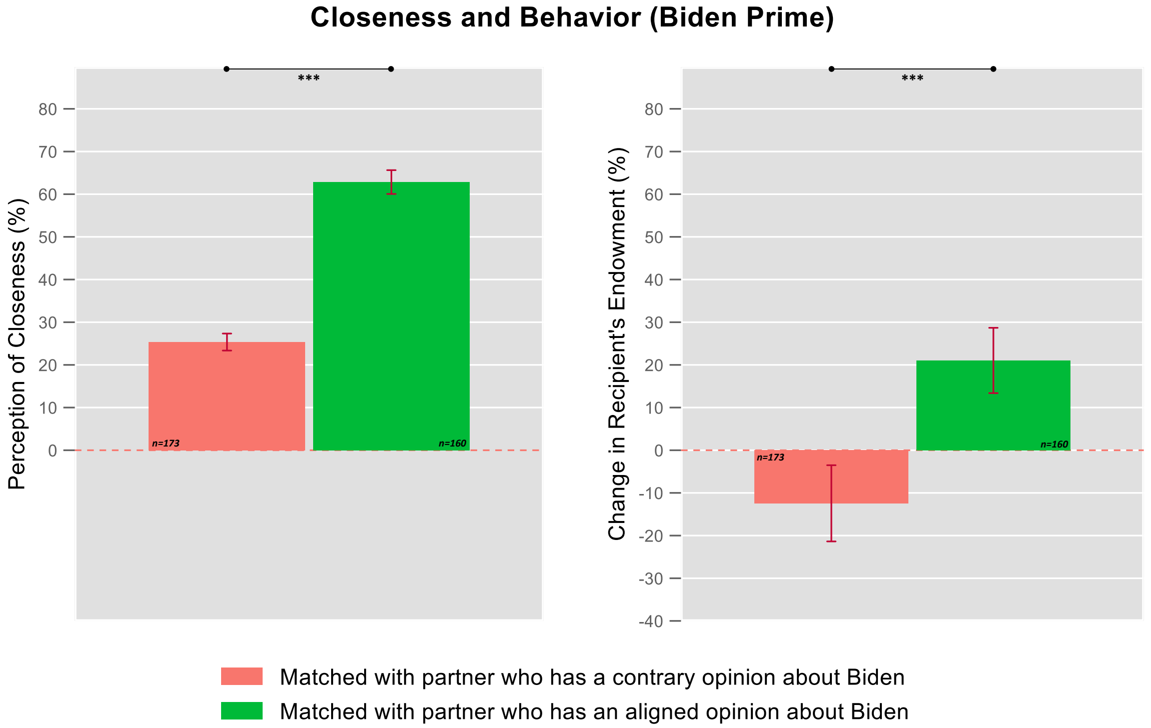


**Figure OA.8:** Closeness and behavior by being matched with a partner who has a (mis)aligned opinion about Biden. Perception of closeness is converted from a 7-point scale to % for illustrative purposes. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

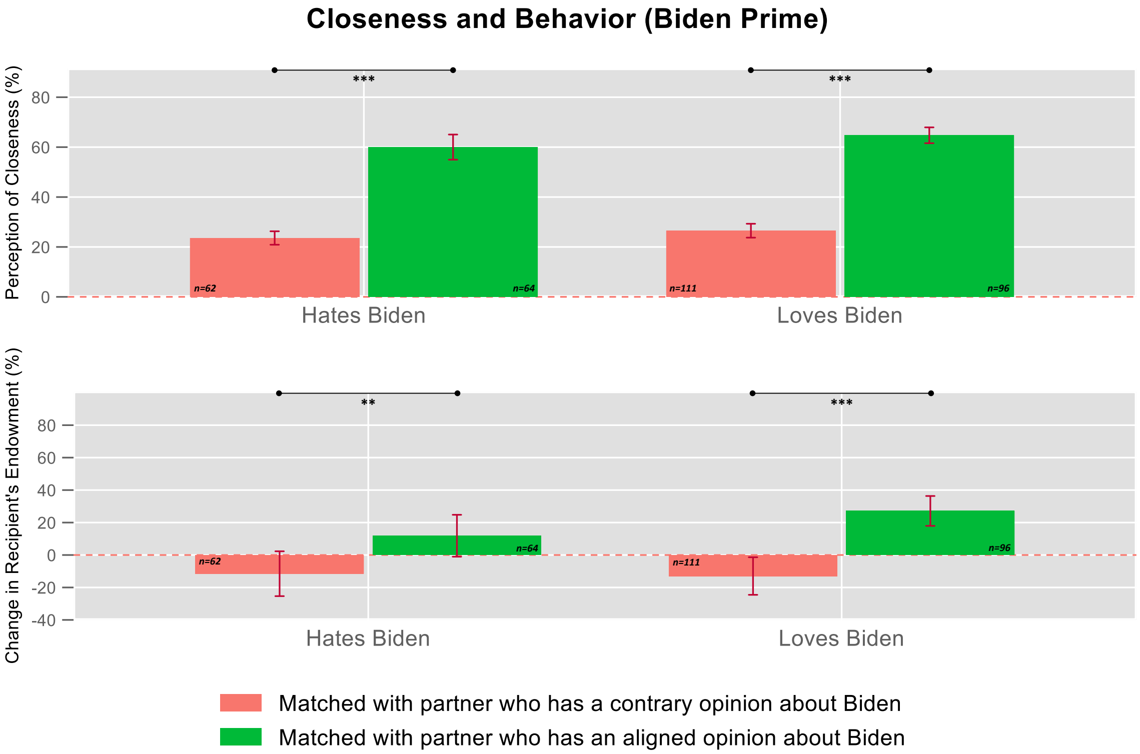


**Figure OA.9:** Closeness and behavior broken down by being matched with a partner who has a (mis)aligned opinion about Biden. Adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

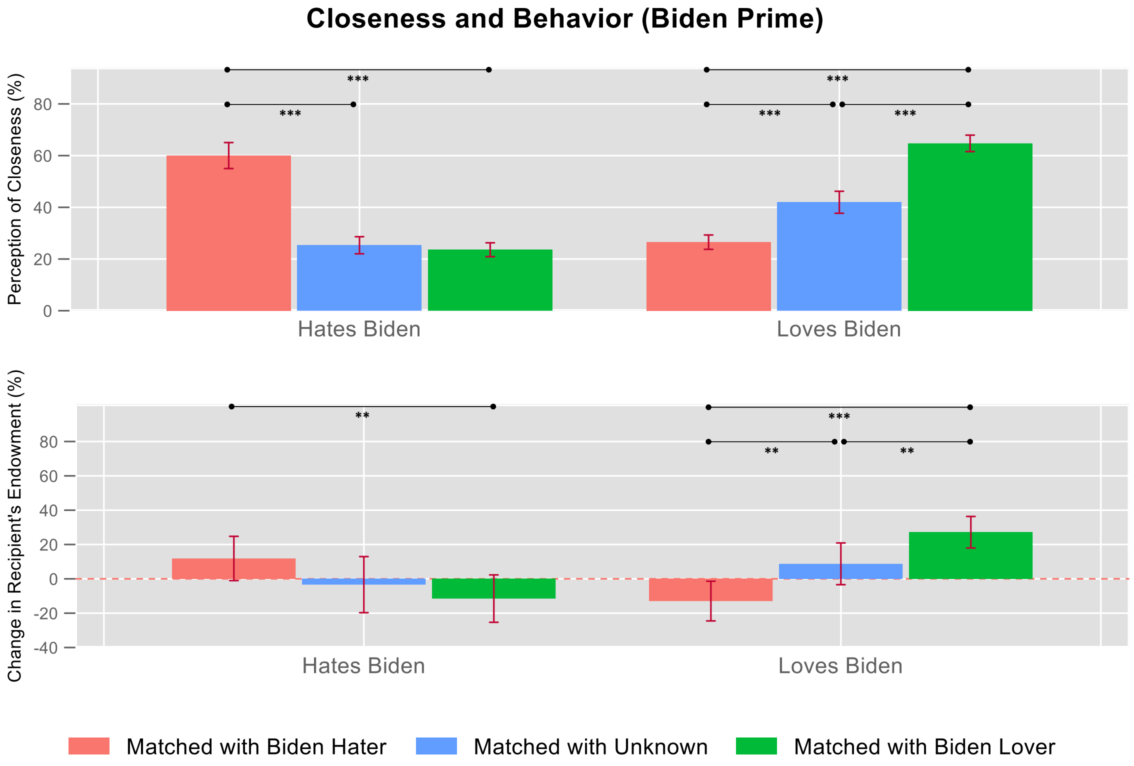


**Figure OA.10:** Closeness and behavior broken down by own opinion and being matched with a partner who has a (mis)aligned opinion about Biden. Adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

## IV.b. Biden Prime – Public Goods Game

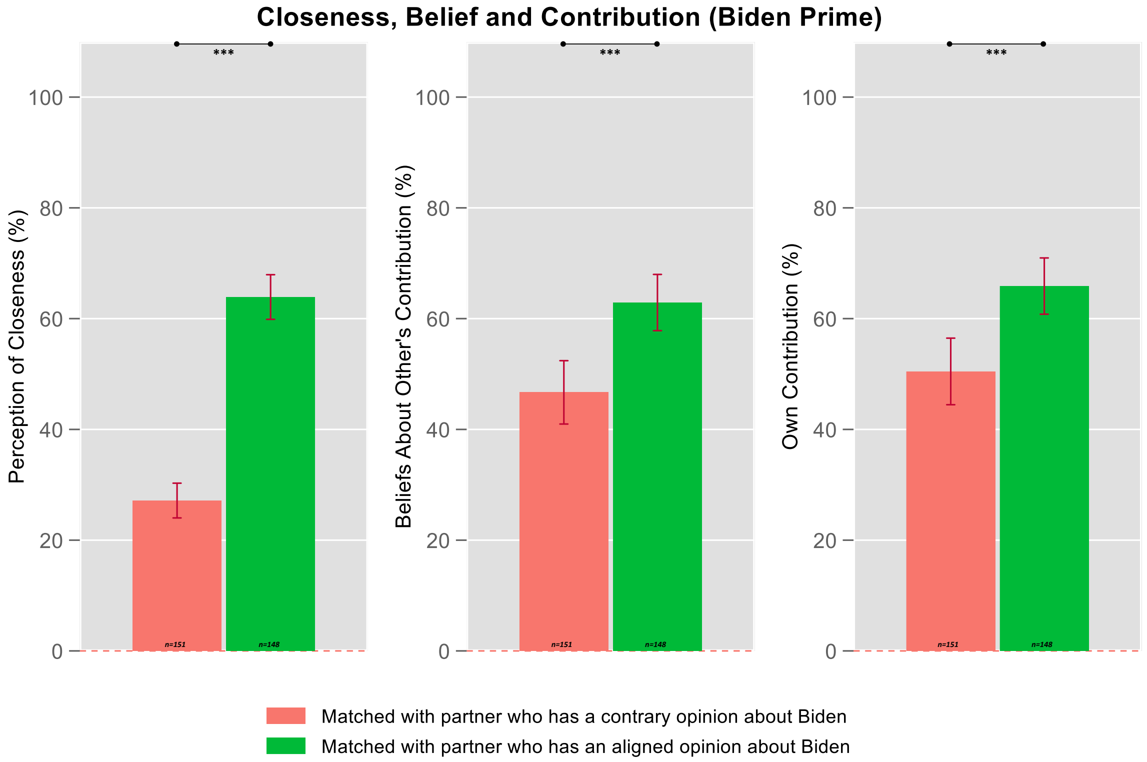


**Figure OA.11:** Closeness, beliefs & behavior broken down by being matched based on the partner's opinion about Biden. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

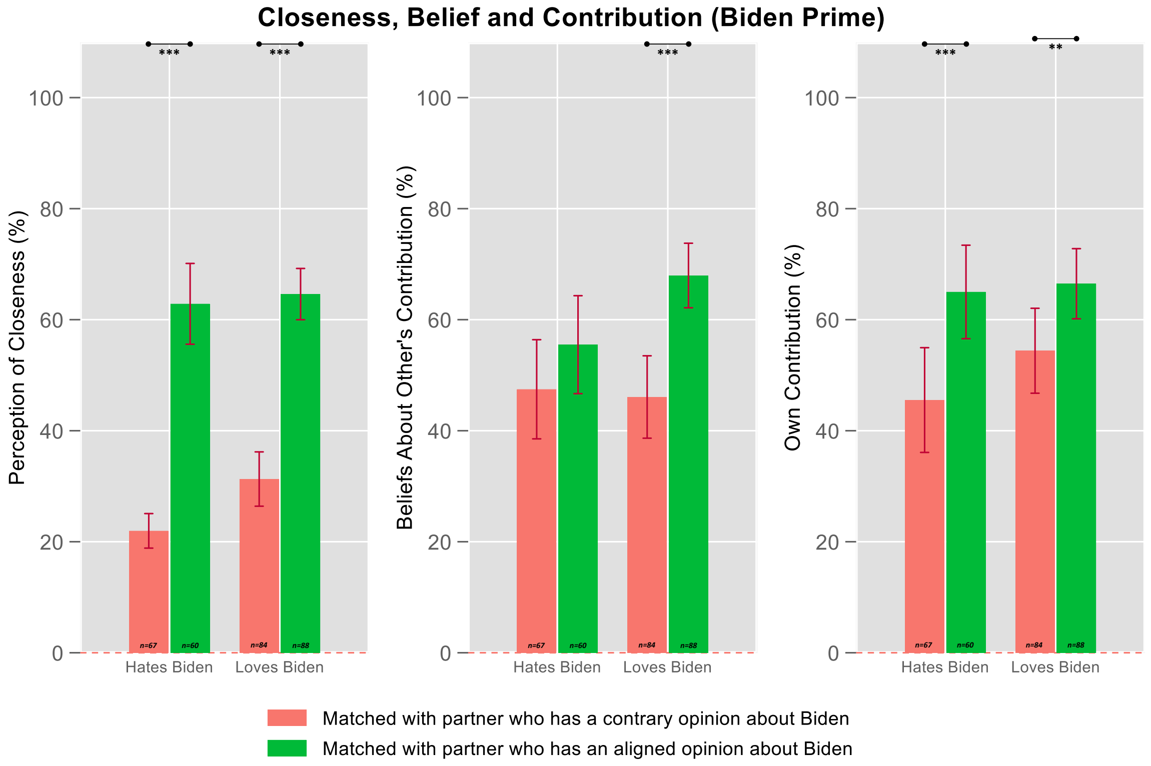


**Figure OA.12:** Closeness, beliefs, and behavior broken down by own opinion about Biden and being matched based on the partner's opinion about Biden. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

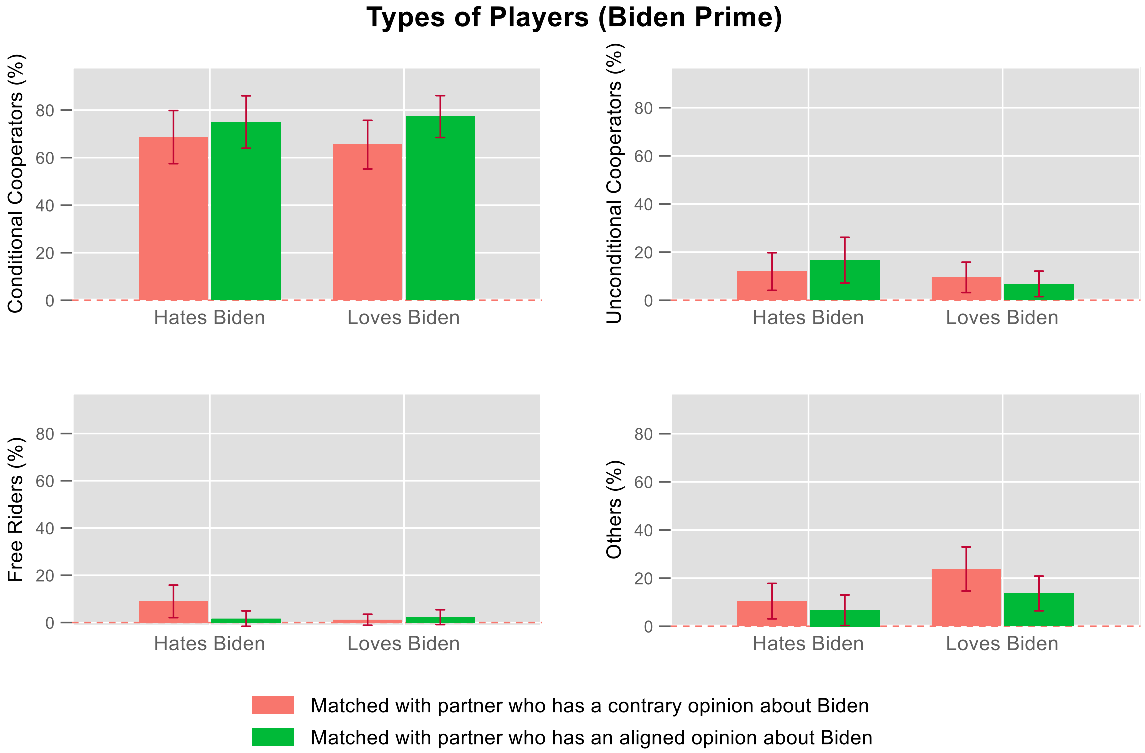


**Figure OA.13:** Types (conditional cooperators, unconditional cooperators, free riders, others) broken down by one's own opinion and being matched with a partner who either has aligned or contrary opinions for the Biden treatment. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

## IV.b. Sports Prime – Dictator Game

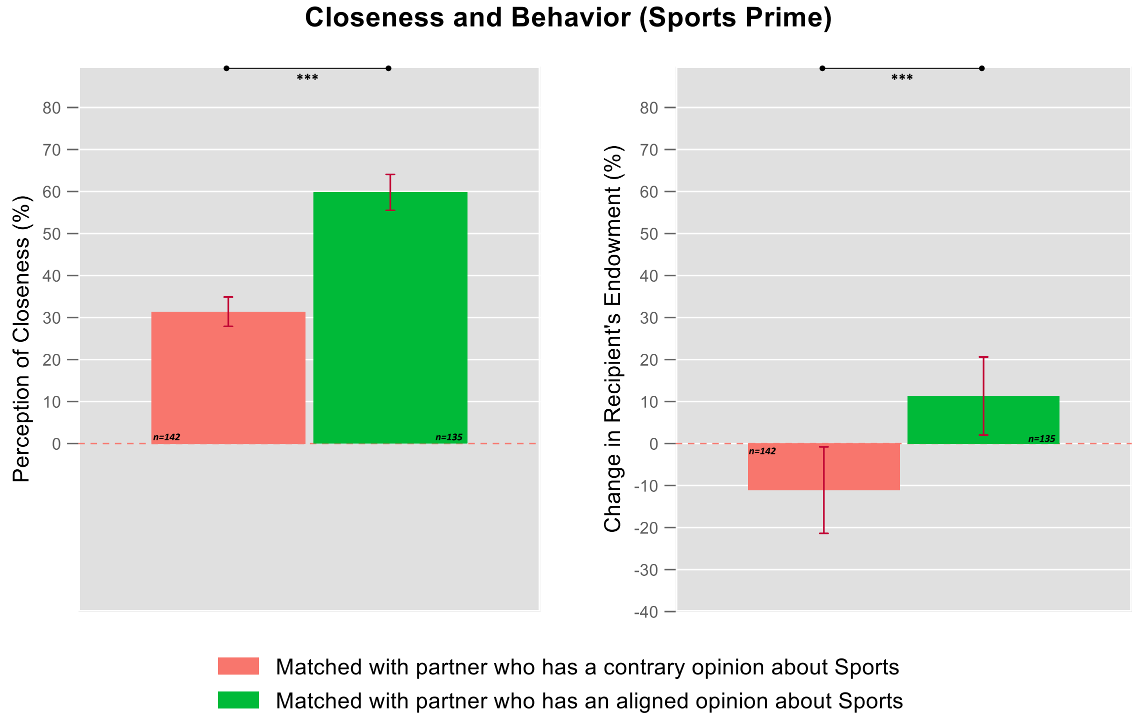


**Figure OA.14:** Closeness and behavior by being matched with a partner who has a (mis)aligned opinion about sports. Perception of closeness is converted from a 7-point scale to % for illustrative purposes. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

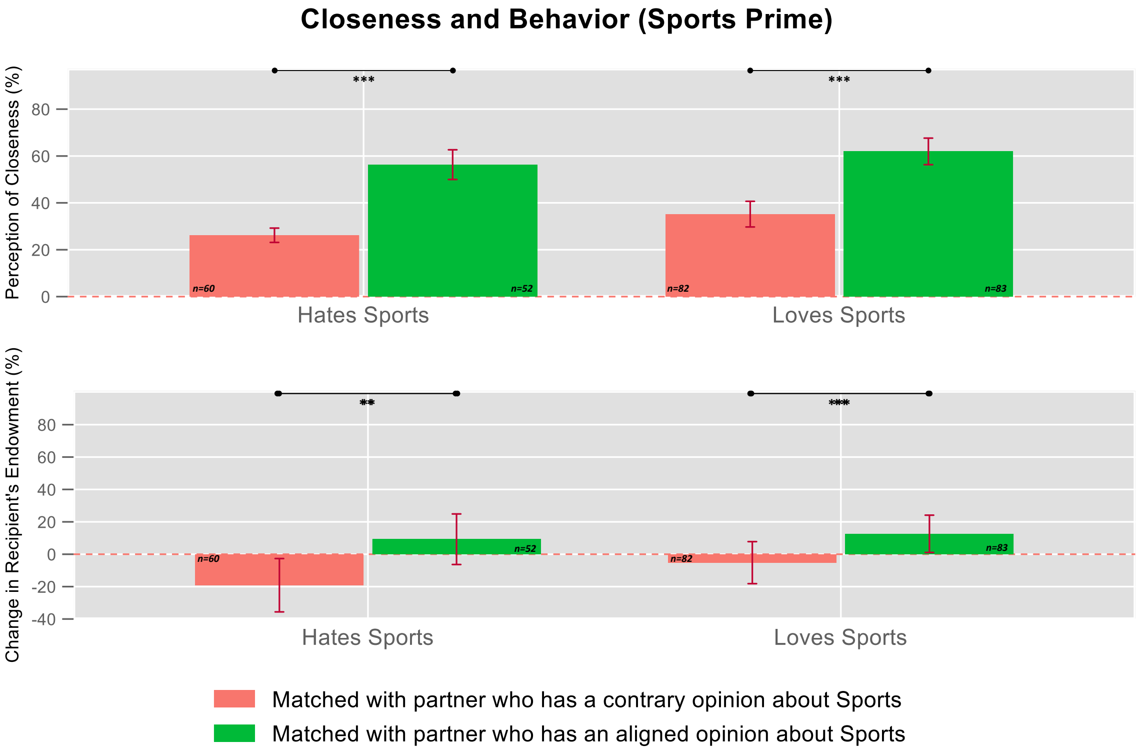


**Figure OA.15:** Closeness & behavior broken down by being matched with a partner who has a (mis)aligned opinion about sports. Adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

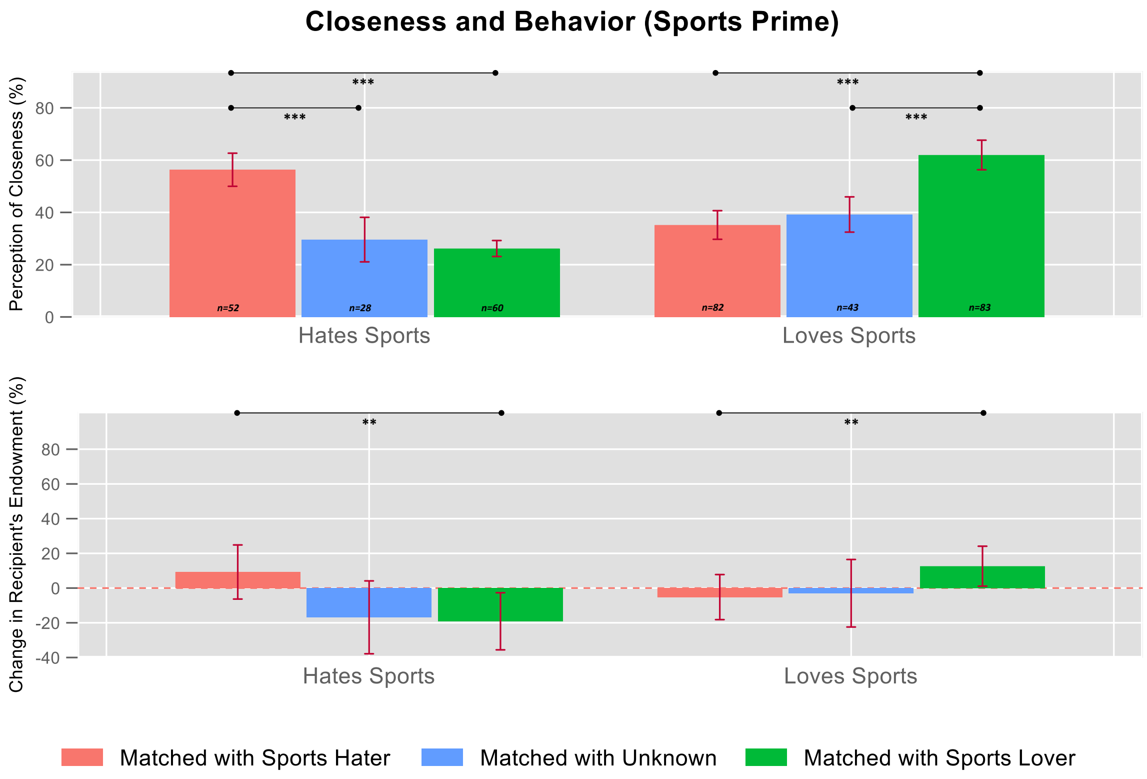


**Figure OA.16:** Closeness and behavior broken down by own opinion and being matched with a partner who has a (mis)aligned opinion about sports. Adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values $> 0.05$.

## IV.b. Sports Prime – Public Goods Game

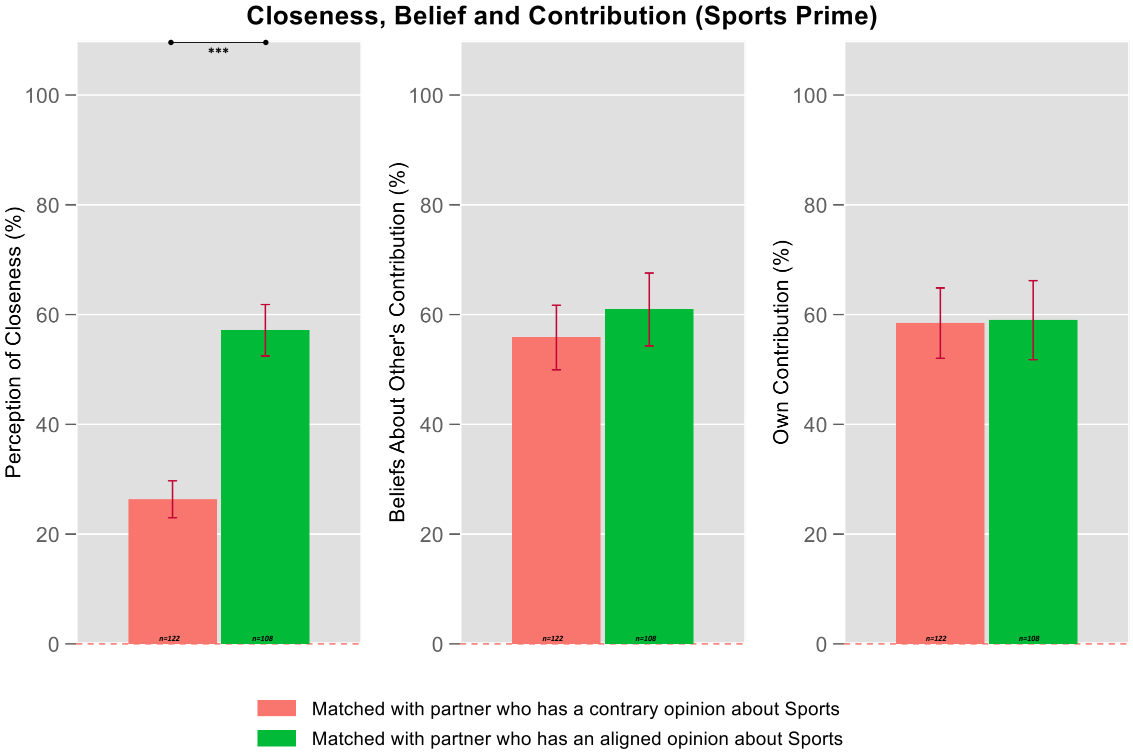


**Figure OA.17:** Closeness, beliefs & behavior broken down by being matched based on the partner's opinion about sports. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

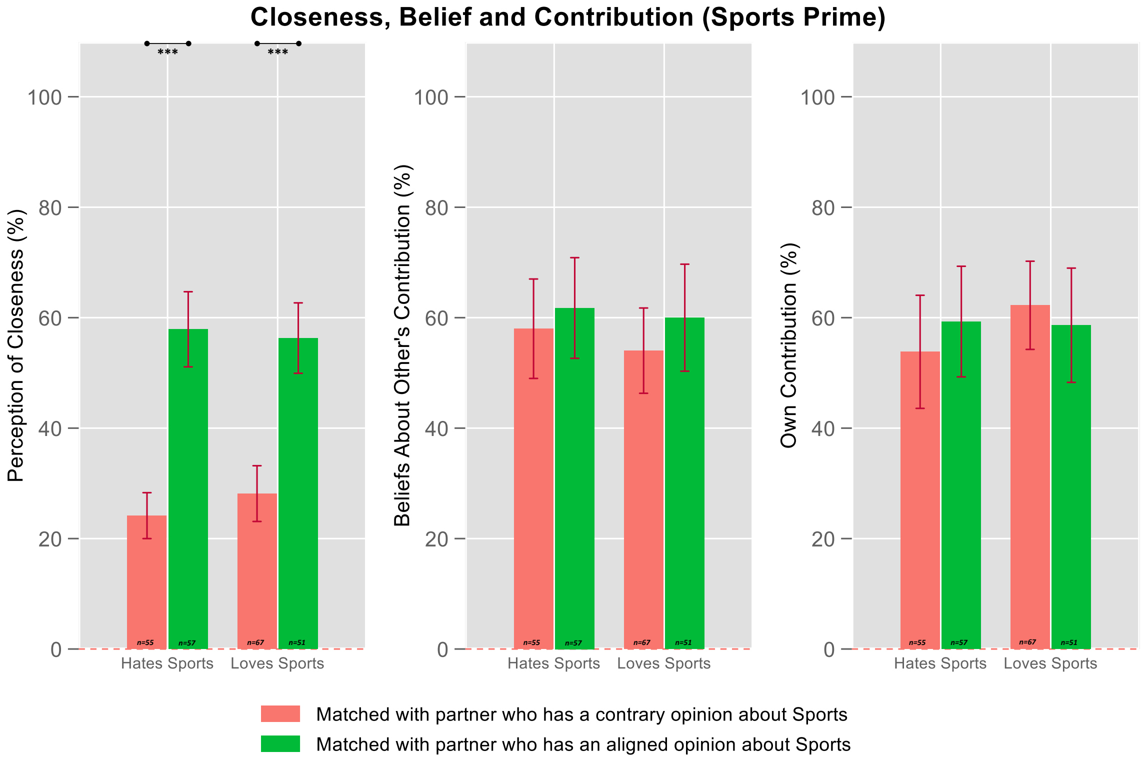


**Figure OA.18:** Closeness, beliefs, and behavior broken down by own opinion about Biden and being matched based on the partner's opinion about sports. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

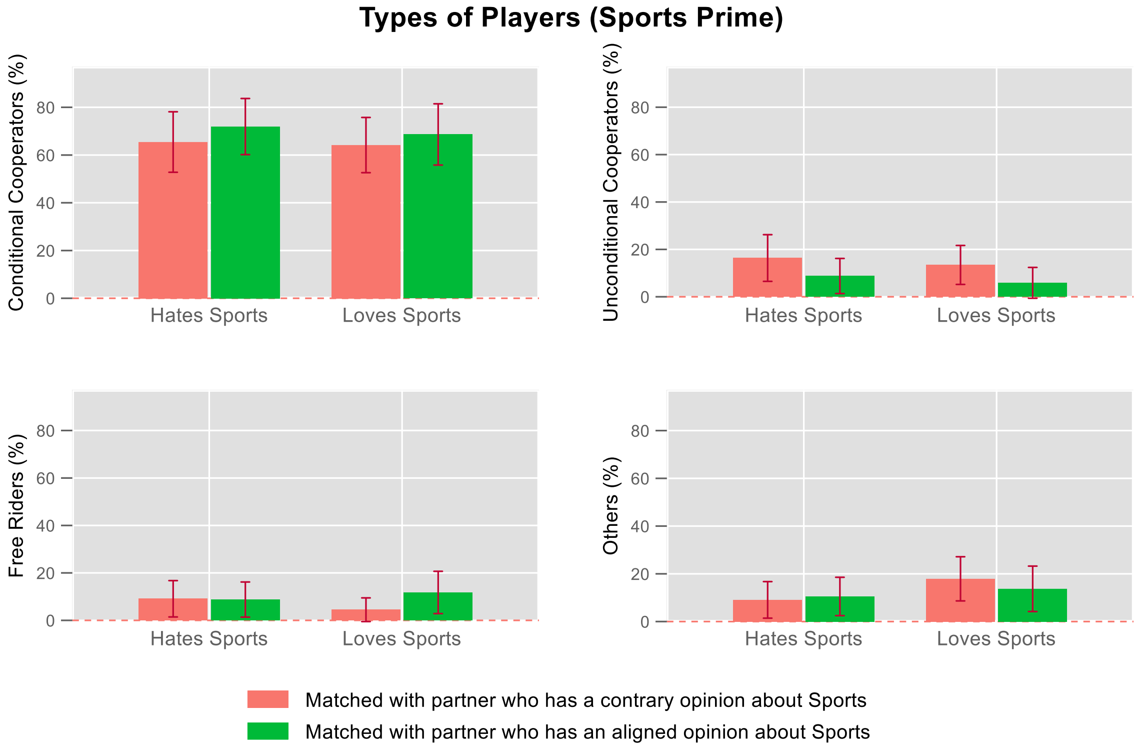


**Figure OA.19:** Types (conditional cooperators, unconditional cooperators, free riders, others) broken down by one's own opinion and being matched with a partner who either has aligned or contrary opinions for the sports treatment. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

# V. Nudge Interventions: Additional Results and Robustness Checks

## V.a. Default Nudge – Dictator Game

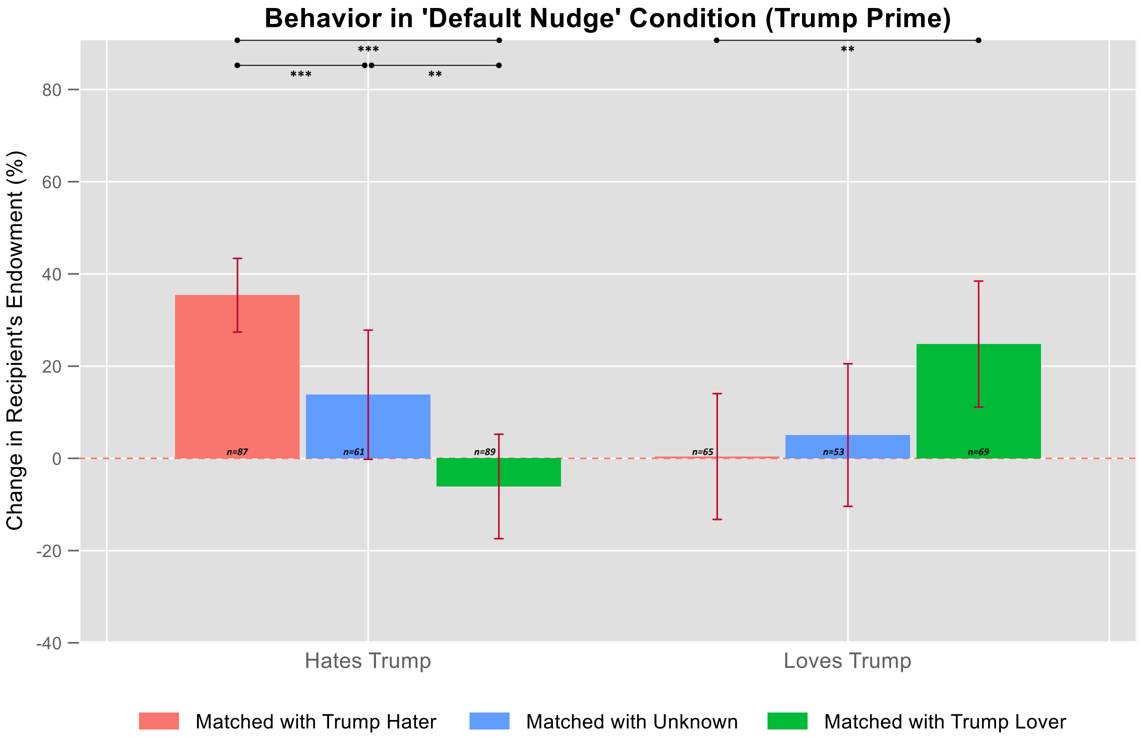


**Figure OA.20:** Behavior broken down by own opinion about Trump and being matched based on the partner's opinion about Trump. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

## V.b. Default Nudge – Public Goods Game

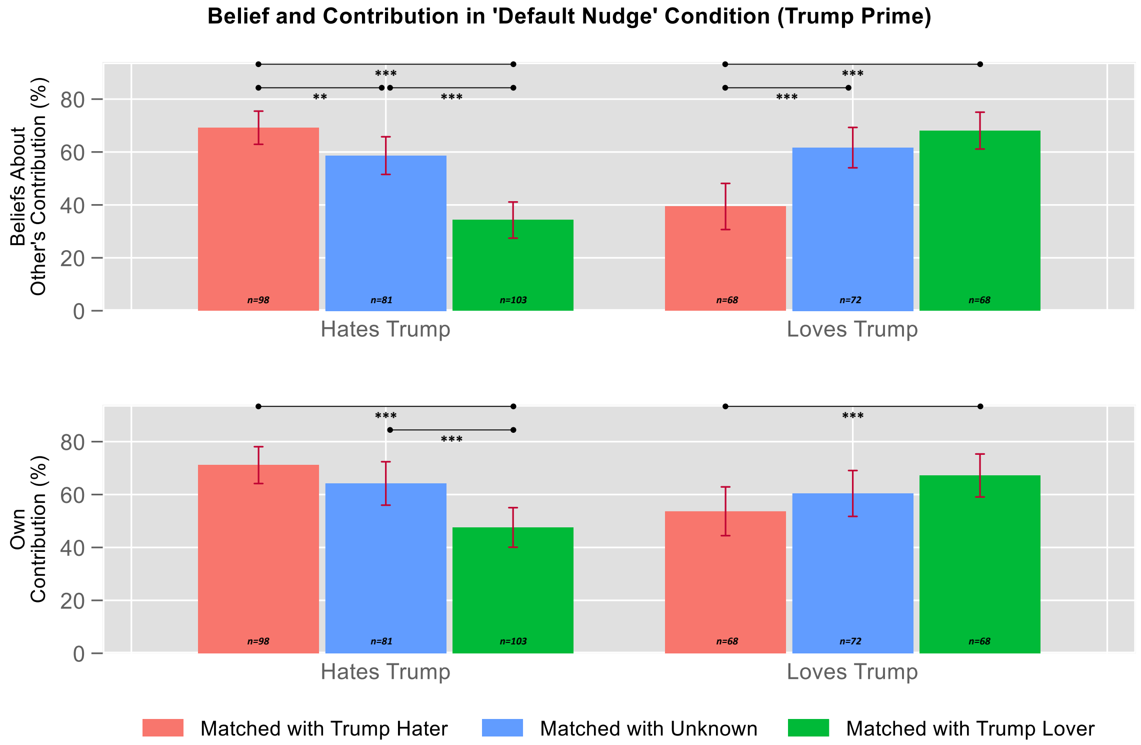


**Figure OA.21:** Beliefs and behavior broken down by own opinion about Trump and being matched based on the partner's opinion about Trump. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

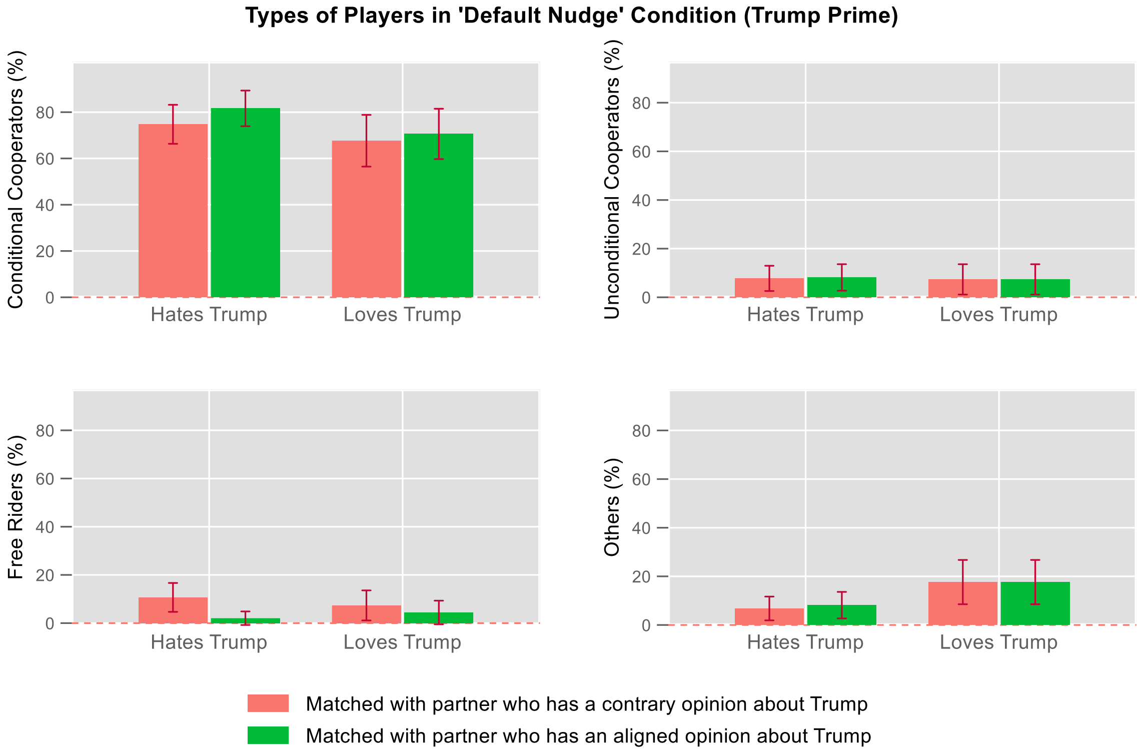


**Figure OA.22:** Types (conditional cooperators, unconditional cooperators, free riders, others) broken down by one's own opinion and being matched with a partner who either has aligned or contrary opinions for the TP treatment. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

### V.c. Information Nudge – Dictator Game

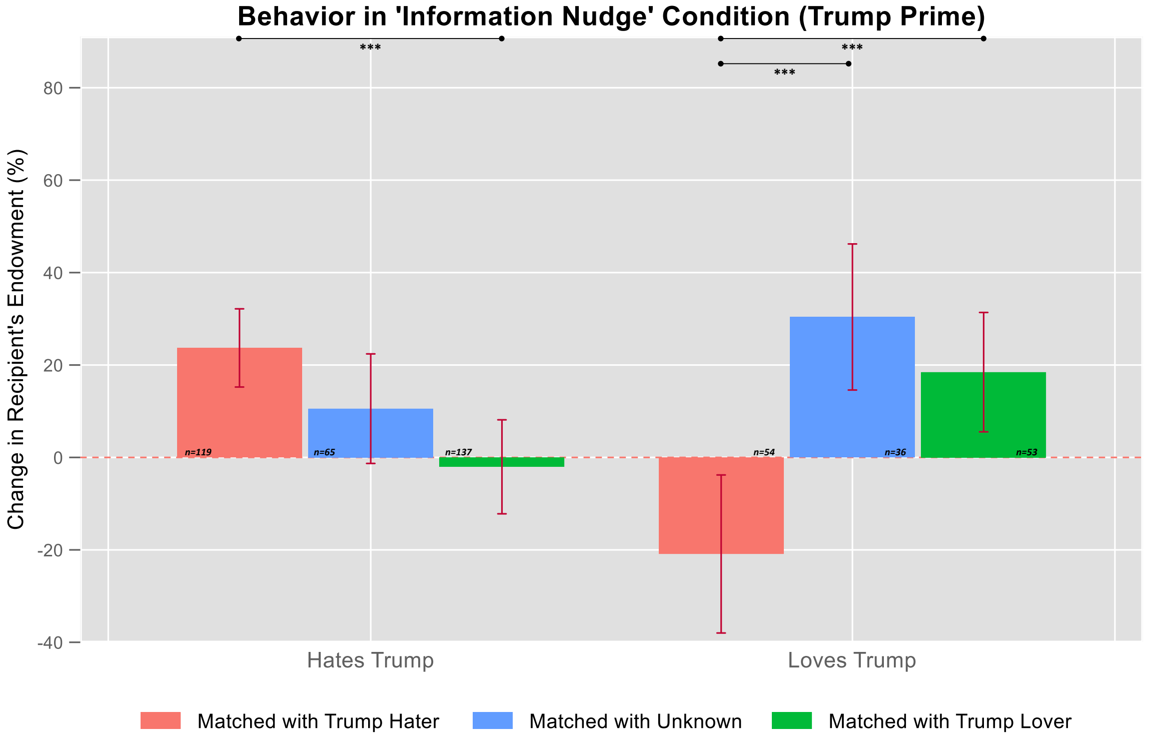


**Figure OA.23:** Behavior broken down by own opinion about Trump and being matched based on the partner's opinion about Trump. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

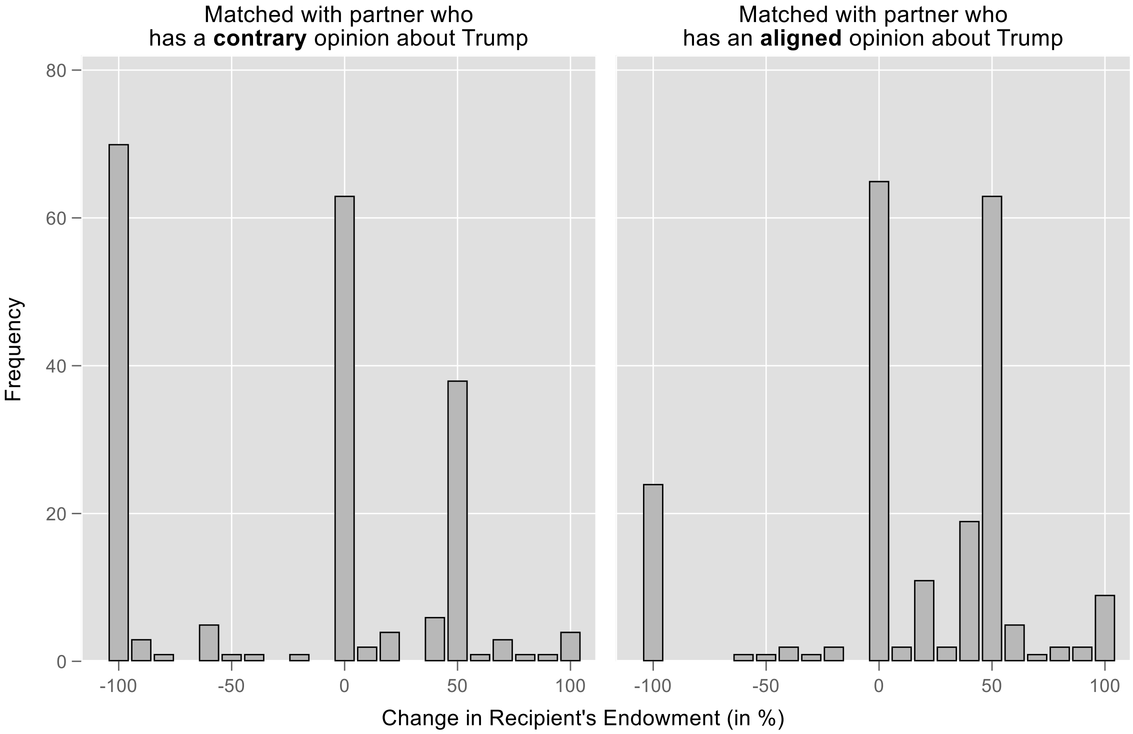


**Figure OA.24:** Frequency of behavior in original Trump Prime experiment (Section 2.1). Truthful information about this data was used in the norm-nudge treatment of the DG.

## V.d. Information Nudge – Public Goods Game

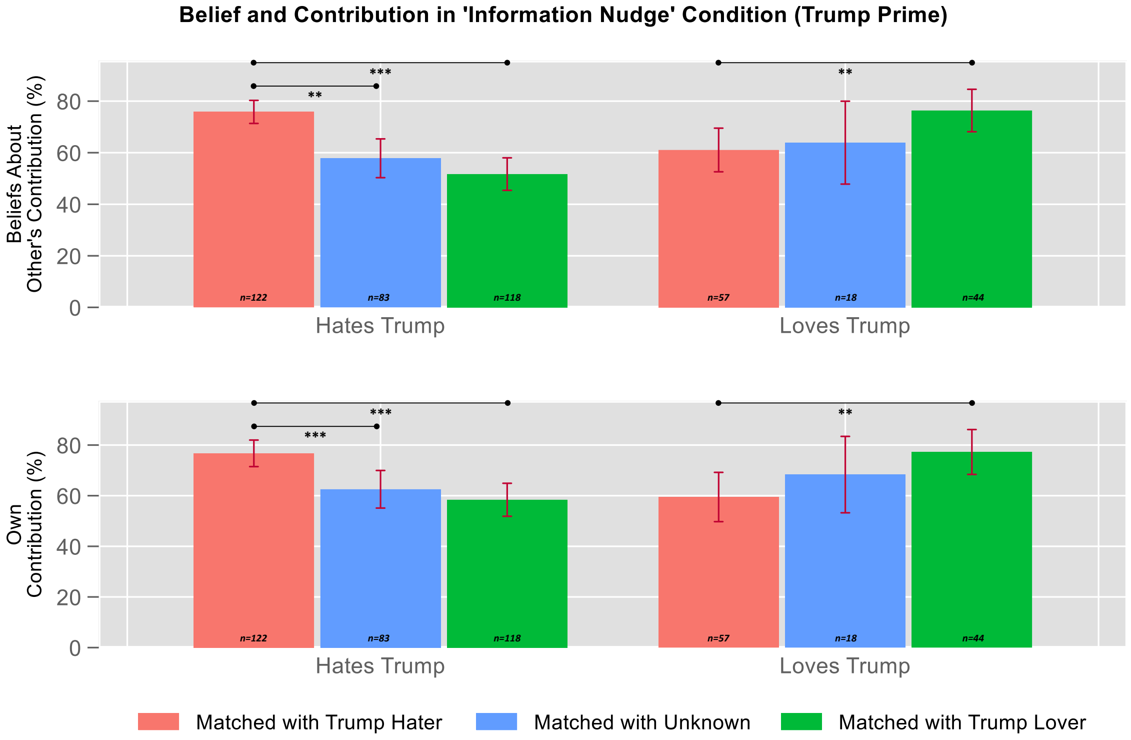


**Figure OA.25:** Beliefs and behavior broken down by own opinion about Trump and being matched based on the partner's opinion about Trump. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

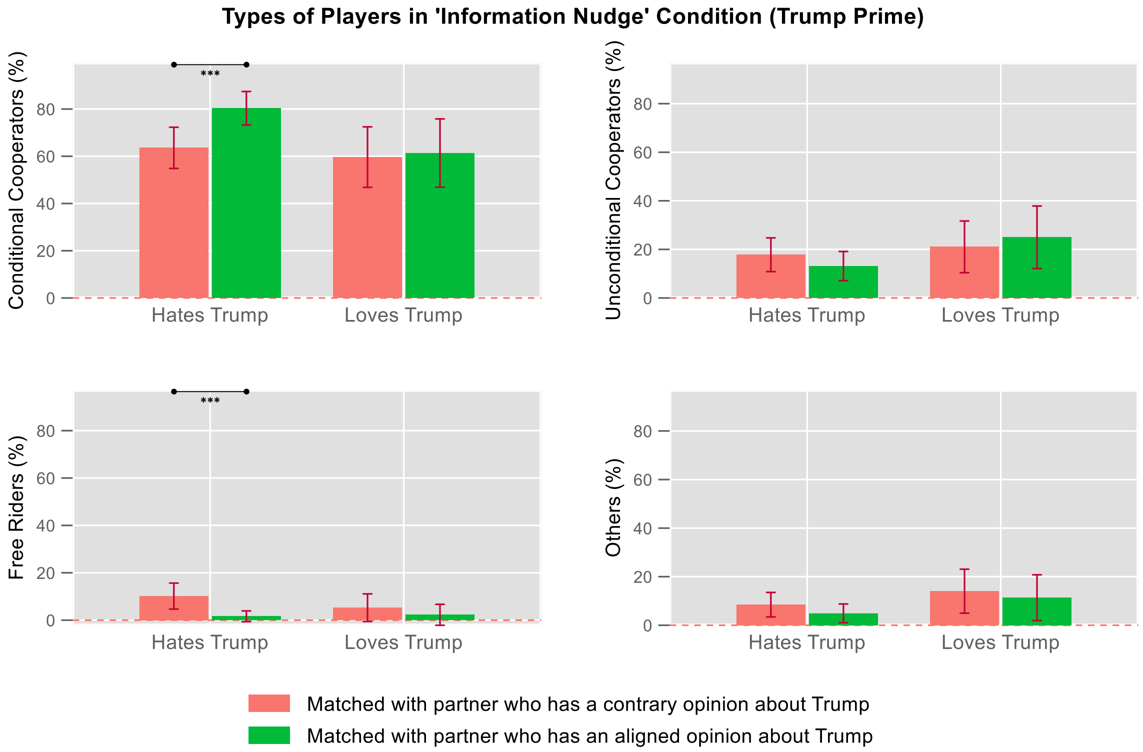


**Figure OA.26:** Types (conditional cooperators, unconditional cooperators, free riders, others) broken down by one's own opinion and being matched with a partner who either has aligned or contrary opinions for the TP treatment. All adjacent bars (within each category) are compared. Absence of significance stars ⇒ p-values > 0.05.

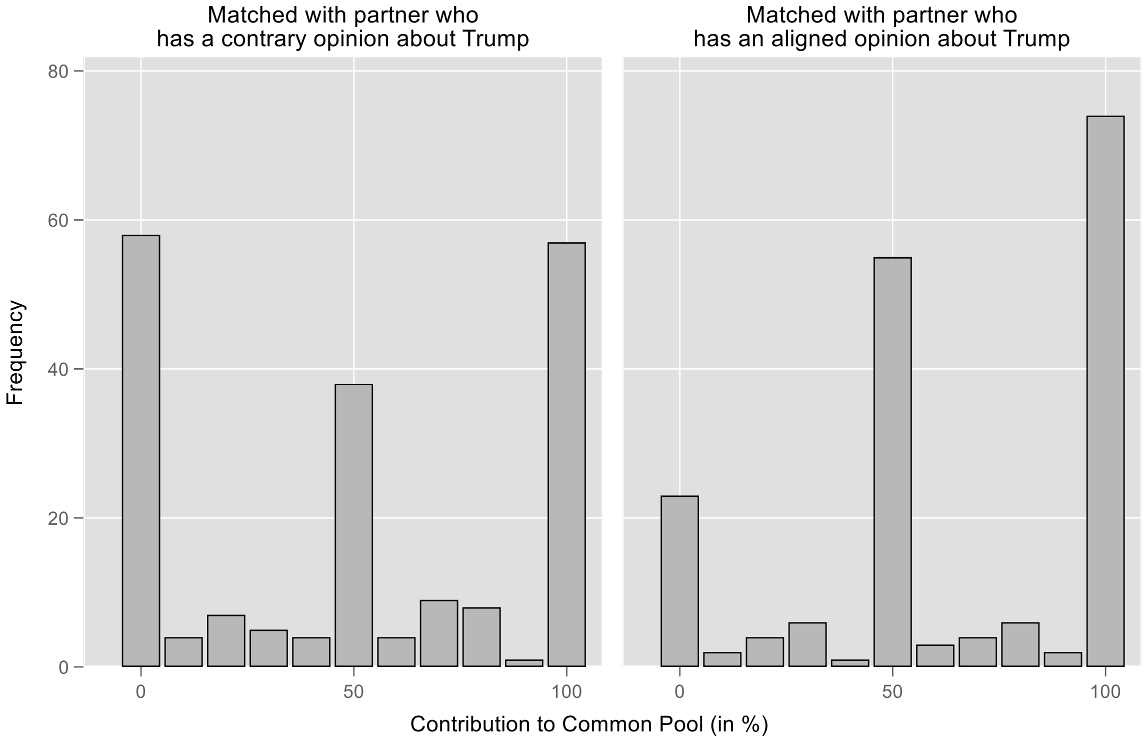
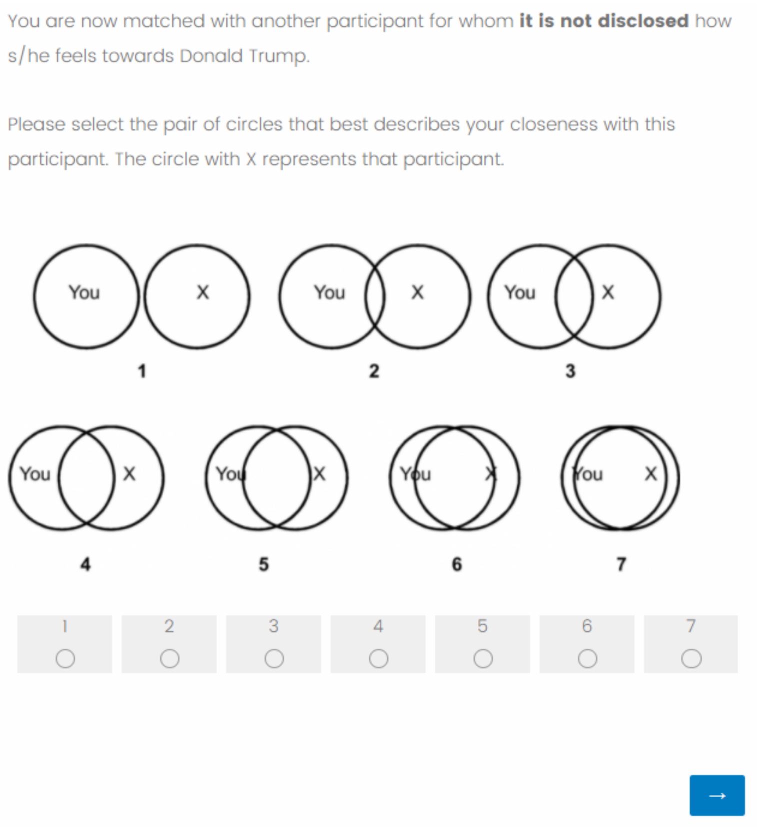


**Figure OA.27:** Frequency of behavior in original Trump Prime experiment (Section 2.2). Truthful information about this data was used in the norm-nudge treatment of the PGG.

## VI. Experimental Screenshots

Below are a few selected examples that tie back to the main text. All original experimental screenshots can be downloaded from: https://osf.io/auh4k/



You are now matched with another participant for whom **it is not disclosed** how s/he feels towards Donald Trump.

Please select the pair of circles that best describes your closeness with this participant. The circle with X represents that participant.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**Figure OA.28:** 'Inclusion of Other in the Self' (IOS) scale as used in all experiments (here exemplified for the condition in which the partner's preference remained undisclosed to the participant).