Keep your promises, even when your peers do not:

A Survey Experiment on the Influence of Social Media on Trust

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Abstract

This study measures the effect of partisan and polarizing social media messages on political trust and trustworthiness in Brazil and Mexico. We implemented two survey experiments with 2,400 respondents each, using a modified "trust game" to measure the effects of social media on two dimensions: trust (the belief that others will fulfill their pledges) and trustworthiness (fulfilling the pledges made to others). Our findings reveal a null social media effect on trustworthiness and a statistically significant decline in trust among users exposed to polarizing partisan messages. The decline in trust is larger if respondents actively '*like*,' '*share*,' or '*comment*' on the message. Results show that individuals are, on average, worthy of our trust, even if we do not trust them. These findings underscore the role of active engagement with social media content as a mediator in diminishing trust. The results also raise questions about the significant gap between trustworthiness and trust.

JEL Codes: D72, D83, D91

Keywords: Trust, Trustworthiness, Social media, Political polarization

1 Trustful Voters and Trustworthy Politicians

In this article, we report the results of two pre-registered experiments measuring the effect of social media messages on trust (the expectation that peers will comply with pledges made to us) and trustworthiness (complying with pledges we make to peers).

Findings reveal a decline in trust among users exposed to polarizing social media messages but no decline in trustworthiness. Users perceive others as less likely to fulfill their pledges after reading polarizing social media messages, and the decline is larger if respondents actively *like*, *share*, or *comment* on the social media message. However, respondents abide by their pledges to others at unchanged rates, with trustworthiness largely unaffected. Therefore, when exposed to polarizing messages, respondents are less likely to *trust* others but remain equally *trustworthy*.

Understanding the effect of social media exposure on trust and trustworthiness is substantively and theoretically important (Banks et al., 2020; Bail et al., 2018). Political trust is critical to citizens' commitment to the rule of law, norms, regulations, and democracy (Keefer, Scartascini and Vlaicu, 2018; Murtin et al., 2018; Scartascini and Valle L., 2020). Research shows that trust in governments increases political participation, voter turnout, support for institutional reforms, and improved compliance with political mandates (Levi and Stoker, 2000). In contrast, mistrust is associated with higher disaffection and lower support for long-term policies with broad-based benefits, such as investments in education. It also reduces support for policies whose benefits are difficult to observe, like bureaucratic reform. Mistrust increases support for policies whose effects are immediate and tangible, even if such policies do not foster long-term sustainable and inclusive growth (Keefer, Scartascini and Vlaicu, 2018).

This article describes survey experiments in Brazil and Mexico that implement a variant of the well-known *trust game*, designed to measure trust and trustworthy electoral behavior. *Trust games* allow researchers to study economic exchanges in low-information environments or in cases where information asymmetries are significant (Berg, Dickhaut and McCabe, 1995), as is the case in political representation. We test whether respondents *trust* others to act on their behalf and whether they are *trustworthy* with the resources entrusted to them, a classic voter-agent problem in representative democracies. In the experiment, we randomly treat a subset of respondents to polarizing or non-polarizing social media messages from an incumbent or opposition politician and measure changes in *entrusting votes (trust)* and *depositing entrusted votes (trustworthiness)*.

Results show that polarizing social media messages decrease trust in others. Respondents were less willing to delegate resources to be invested on their behalf (*entrusting votes*). However, polarizing social media messages do not make people less trustworthy. Respondents deposited the promised resources at the same rate. Our findings spell a simple message: as polarization increases, *do not trust your peers but fulfill your duty to others as promised.*

Our work offers three novel contributions to scholars studying social media, trust, and democratic governance. First, we find that partisan social media messages reduce trust behavior.[1] The decline in trust behavior is self-interested and cannot be explained by the desire of the respondents to comply with the researcher or the instrument.

Second, we show conclusively that social media engagement magnifies the effect of the experimental treatment. This is a crucial contribution which shows that "doing" social media is different from "reading" social media. Engagement matters, and it affects political behavior. The finding is particularly relevant for the burgeoning literature on incidental exposure to news (Boczkowski, Mitchelstein and Matassi, 2018; Fletcher and Nielsen, 2018; Settle, 2018; Weeks et al., 2017; Anspach, 2017). There is a larger decline in trust among respondents who actively *like* and *share* the treatment than in the control group. Our two-way design, comparing engaged and non-engaged users in the treated and control groups, shows that the decision to interact with a social media post increases the negative effect of polarizing messages.

Third, we contribute methodologically to the study of *trust games*, presenting a survey design that replicates important behavioral responses from in-person lab experiments. Our online survey design rapidly scales up to large numbers of cases, increasing the study's external validity.

Latin America exhibits very high rates of social media penetration and among the lowest levels of trust in the world (Singer, 2023). However, the relationship between social media penetration and trust remains underexplored. Further, Brazil and Mexico, the two largest economies in the region, display high rates of social media penetration. High polarization and social media penetration provide excellent cases to study how voters modify their trusting behavior when exposed to social media messages.

The organization of this paper is as follows. First, we describe the substantive importance of testing for the relationship between social media exposure, trust, and trustworthiness. Second, we present our experimental design and its implementation in Mexico and Brazil. Third, we present our general ex-

[1] See Tucker et al. (2018) for an overview of the recent literature on social media.

perimental results, with estimates that distinguish between partisan source identity and the polarizing tone of the content. Fourth, we describe extensions of our results that show the mediating effect of sharing behavior on the effects of exposure on interpersonal trust. We conclude with a discussion of possible further extensions of our work.

2 Trust, trustworthiness, and social media framing

Trust and trustworthiness are fundamental forces that shape societies and institutions (formal and informal) and co-evolve with them (Arrow, 1974; Guiso, Sapienza and Zingales, 2004). Research shows that trust and trustworthiness have positive effects on the ability of people to make transactions and on the ability of governments to function (Arrow, 1974; Jacobsen, 1999; Zak and Knack, 2001; Algan and Cahuc, 2014; Bjørnskov and Méon, 2015; Algan et al., 2017). High trust correlates with higher growth, social progress, and democratic stability (Algan and Cahuc, 2010, 2014; Keefer et al., 2020). More importantly for democratic governance, recent research shows that declining trust makes citizens less likely to reach consensual policy decisions (Ryan et al., 2020).

Studying trust has become ubiquitous across many different fields. Most studies use well-known survey questions that measure *trust attitudes* rather than *trust behavior*.[2] This is problematic, as there is consistent evidence that trust attitudes and trust behavior are weakly correlated (Wilson, 2017). Importantly, the analytical connection between the social benefits of trust and trustworthiness makes sense in terms of behaviors rather than attitudes.

In the last two decades, *trust games* have revolutionized economics and political science, generating data on trust and trustworthy behavior rather than descriptions of individual-level attitudes. Democratic representation is a particular type of trust game in which a voter (*the principal*) supports a politician (the *agent*) to act on her behalf. The *principal-agent* relationship is difficult, with decisions made by a politician often hidden from the public's view. This raises the specter of abuse by officeholders, who are expected to fulfill their mandates even if these do not align with their preferences or interests. We expect politicians to be *worthy of our trust*, although they frequently deceive us (Hardin, 2002). We also consider ourselves to be *worthy of the trust of others*, although we are often willing to explain away why

[2]Examples include agreement questions such as "Most people can be trusted" as well as scale questions of reported trust in family, friends, and neighbors.

we default on our promises (Ariely and Jones, 2012). Using this idea of democratic representation as a type of trust game, our paper models how exposure to social media induces changes in interpersonal trust and trustworthiness behavior.[3]

Our work describes how exposure to polarizing social media messages affects interpersonal trust and trustworthiness behavior. Our design embeds a vignette with one of four different social media messages between the stages of our trust game. Canonical work on framing effects (Entman, 1993; Iyengar, 1990) shows that distinct frames alter the perceived legitimacy of an actor or event, with more polarizing frames activating "us vs them" identities and increasing negative feelings toward others (Mason, 2016; Banks, 2014). In SIF Appendix B, we provide a theoretical model based on a simple guilty game with latent parameters to describe the mechanism behind changes in trust and trustworthiness in our design. Although evidence for the effects of social media exposure on polarization is robust (Bail et al., 2018; Banks et al., 2020), relatively little is known about similar effects on a broader set of citizens' behavior, such as interpersonal trust and trustworthiness. Of particular relevance is distinguishing the effects of incidental exposure and active engagement (Boczkowski, Mitchelstein and Matassi, 2018; Fletcher and Nielsen, 2018; Anspach, 2017; Stroud, 2010). Indeed, changes in trust behavior are modest when consumption is incidental and much more substantive when respondents actively engage with the treatments.

3 Trust Game: Nuts and Bolts

Game Sequence and Trust/Trustworthiness Interventions

To measure the effect of social media messages on trust and trustworthiness, we embed a political trust game in a survey experiment that exposes respondents to contextually appropriate tweets from government or opposition political figures. In our game sequence, respondents select one of two fictional cartoon candidates. We incentivize respondents to collect votes for their candidate by distributing raffle tickets to win an iPad, conditional on their candidate winning the election.[4]

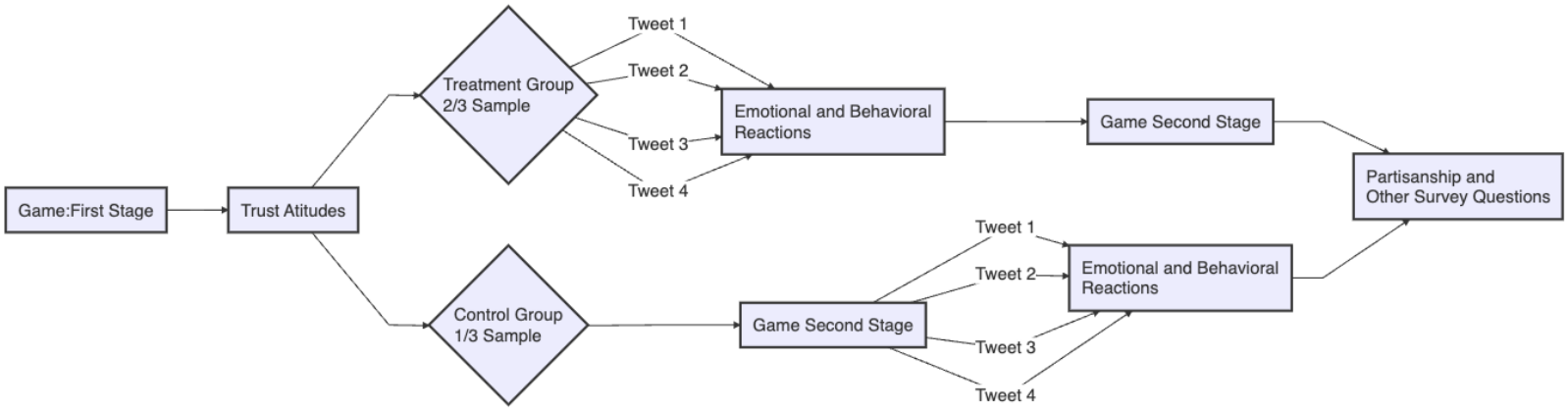
[3]For a general discussion of trust and trustworthiness, see Hardin (2002). In Hardin, trustworthiness is described as an instrumental trait, where a politician seeks to build a reputation over repeated interactions. Similar descriptions of trustworthiness as reciprocity are found in Croson and Buchan (1999) and Fehr and Gächter (2000).

[4]Our survey experiment institutes a universal respondent who carries out all requests received from respondents. As in Cox (2004), we effectively create a triad where respondents' decisions to cast or entrust votes are independent of one another.

Respondents collect tickets to the raffle depending on how many votes they personally contribute to their candidate. Therefore, collecting as many votes as possible is incentive compatible: by making sure their candidate wins, they become eligible to participate in the raffle, and by collecting more votes, they increase their chances of winning the final prize.[5]

[5]Four iPads were distributed in the raffles in Mexico and Brazil, making the odds/price ratio very attractive. At the time of the survey, the local price of an iPad was approximately 1.5 times the median monthly salary in Brazil and half the median salary in Mexico.

Figure 1 Survey Diagram



Respondents can perform two distinct behaviors: first, as an *agent*, respondents pledge to cast votes entrusted to them (trustworthiness). Second, as a voter or principal, respondents cast directly or entrust votes to others, with the provision that entrusting votes to others counts double. In each round, respondents play firstly as an agent, depositing votes entrusted by others (trustworthiness), and secondly as a voter who entrusts votes to others (trust). As agents, respondents decide whether to deposit the votes entrusted to them by others. As voters, respondents decide to either cast votes directly or entrust them to others. Each vote cast directly counts as a single raffle ticket (single vote). Every vote entrusted to others counts double (two raffle tickets) but only if deposited. Unbeknownst to our respondents, every entrusted vote is accepted by our "universal" respondent, but they do not receive this information. We repeat this procedure and analyze changes between the first and the second round. Figure 1 illustrates the experimental design and survey flow.

First Round: Setting a Baseline

Respondents select one of two candidates, Laura or Juan,[6] who have no distinctive markers other than their gender. When selecting a candidate, respondents are informed that they will have multiple opportunities to increase the votes they allocate to their candidate of choice and, more importantly, supporters of the overall survey winner (Laura or Juan) are eligible to participate in a raffle for one of two new iPads.

Respondents are then informed of how to increase votes for their candidates. First, they win votes by reading a commitment pledge to act as agents for other respondents, to reinforce how votes are collected and to ensure that the importance of depositing votes is conveyed.[7]

[6] We used the respective translations for the names in Portuguese in the Brazilian survey.

[7] The instruction tells respondents that they can win five more votes for their candidate if they read the pledge: "*If other players delegate their votes to me, I agree to follow their preferences and cast their votes for the candidate they choose.*" To win the five votes, players are asked to answer either, "*I read the pledge*" or "*I did not read the pledge.*" We do not require them to sign the pledge, only to read it.

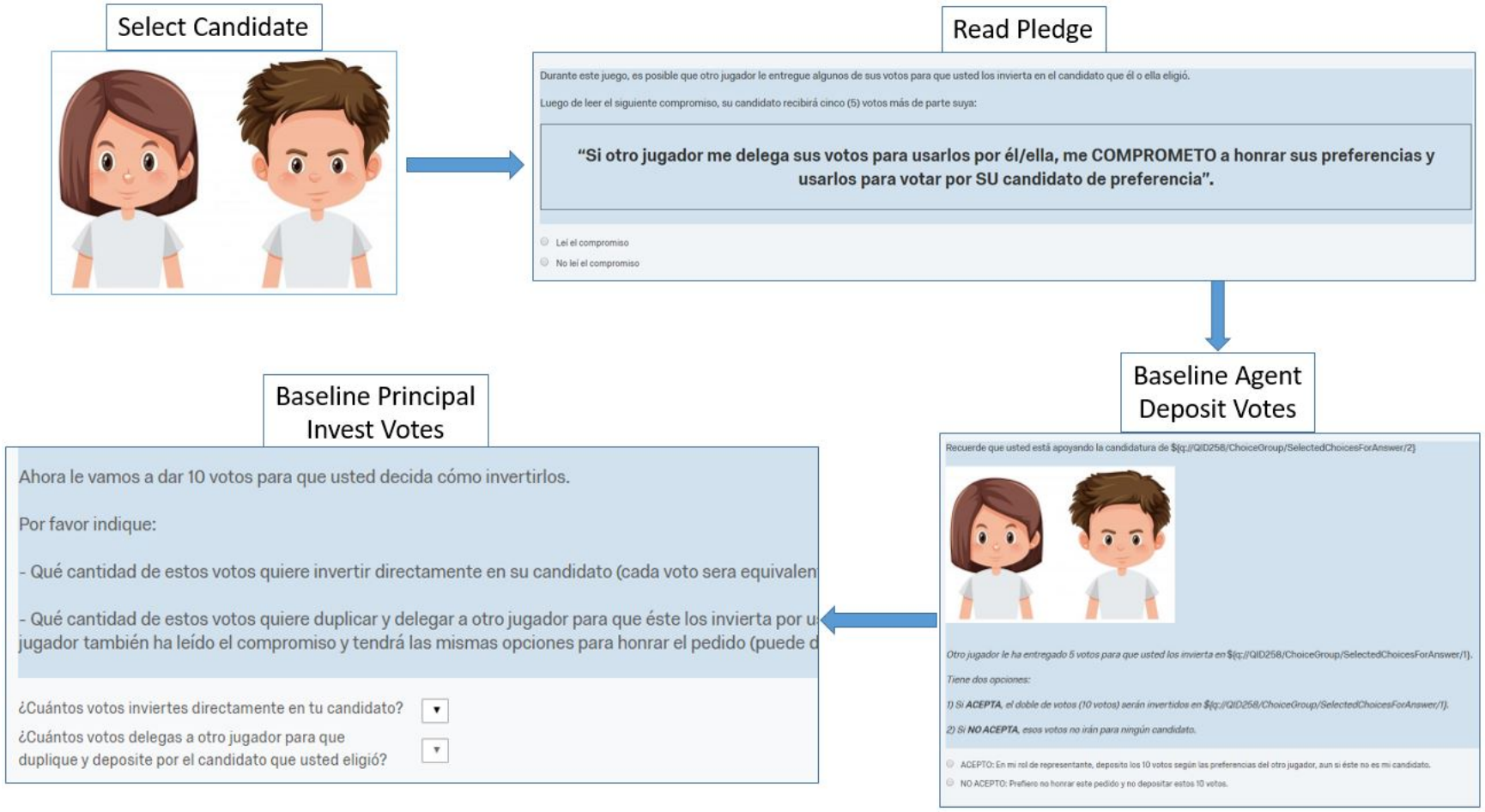


Figure 2 Experimental design: Respondents are asked to select a candidate to support throughout the survey. Respondents accumulate votes for their candidates; each vote counts as a ticket for a raffle among the winning candidate's supporters. Respondents may cast votes directly (one vote = one raffle ticket) or entrust votes to another player to cast. Entrusted votes count double, increasing the odds that their preferred candidate will win and the number of raffle tickets to win the iPad.

In this first round, we set a trustworthiness baseline, asking respondents to cast votes entrusted to them by another respondent. We then offer respondents 10 votes they can use to increase their raffle tickets. They may use these votes in two possible ways: (i) they can cast votes directly to support their candidate, or (ii) they can entrust votes to be cast on their behalf, with the provision that entrusted votes count double if deposited by a peer. All these steps are summarized in Figure 2.

Second Round: The Tweet Treatment

Once the experiment's baseline is set, we distract the respondent by asking various attitudinal, behavioral, and socio-demographic questions. These include questions about standard economic and political attitudes, measures of political knowledge, and perceptions of personal trust and trust in institutions.

We randomly select two-thirds of respondents to be exposed to tweets before playing the second round, with the remaining third serving as a control group, as depicted in Figure 1. After exposing respondents to the tweets, we ask if they would *'like'*, *'retweet'*, *'reply'*, or *'ignore'* the tweet they just read. We follow up with a question that asks how the tweet made them feel ("angry", "sad", "hopeful", etc.). Finally, we measure *trustworthiness* and *trust* for the treated group. They are then asked to invest in their candidates and to cast votes, as shown in Figure 2.

The treatment group reads the tweets before playing the second round of the game. The control group plays the second round and only then reads the tweet, ensuring we register a behavioral response to the tweets for the entire sample.

4 The Hypotheses: Trust and Trustworthiness

As described, one-third of the respondents are randomly assigned to the control group and two-thirds to the treatment group (see Figure 1). Participants in the treatment group read the social media message before the second round of the trust game, while those in the control group read the message after the second round. Therefore, the control group is unaffected by the Tweet when entrusted with votes and when entrusting votes to others.

4.1 The Treatments

The experimental treatments in Brazil and Mexico present respondents with COVID-19 messages by prominent politicians. In March and April of 2020, COVID-19 was a salient and partisan issue in both countries (Calvo and Ventura, 2021; Aruguete et al., 2021).

The message of the tweets varied in two dimensions: first, the party of the author of the tweet (incumbent or opposition politician), and second, the tone of the messages (positive or negative).

The experiment randomly rotated the author of the tweets between two high-level political figures from either the government or the opposition. On the other hand, the tone of the tweet attributed blame to the out-group politician (polarizing tweet) or signaled a willingness to cooperate (non-polarizing tweet) during the crisis.[8]

4.2 The Hypotheses

Non-polarizing messages report to voters the willingness of political elites to cooperate with rivals to fight the COVID-19 pandemic. The messages signal to respondents the importance of unity and cooperation in managing the crisis. Polarizing partisan messages blame political opponents for sowing conflict and weakening the needed response to the crisis. These polarizing tweets frame the COVID-19 response as an "us vs. them" problem (Iyengar, Sood and Lelkes, 2012; Iyengar and Westwood, 2015; Mason, 2016). The initial hypotheses of the experiment, as stated, reflect the expectation that non-polarizing social media messages will increase trustworthiness and trust while polarizing messages will reduce both.

HT_0A**: Non-polarizing social media messages increase compliance by agents and trust among principals.**[9]

HT_0B**: Polarizing social media messages decrease compliance by agents and trust among principals.**

Because the tweets may be endorsed by politicians who are aligned or misaligned with the preferences of the respondent, we test for the effect of partisan alignment (in-group) or partisan misalignment

[8]The complete wording of the treatment is presented in Appendix A of the SIF.

[9]The Pre-Approved plan used the term "partisan" instead of "polarizing," which was correctly flagged by reviewers as confusing. The wording of the original hypotheses was modified accordingly.

(out-group) on *trust* and *trustworthiness*.[10] A broad literature in political behavior shows that partisan alignment is central to attitude formation in areas as distinctive as candidate evaluation, economic perceptions, support for democracy and authoritarianism, and policy preferences (Green, Palmquist and Schickler, 2004; Arceneaux, 2008; Slothuus and De Vreese, 2010; Evans and Andersen, 2006; Zaller, 1992). Informed by the literature on partisan identities, we expect the endorsement of out-group politicians to augment the effect of non-partisan and partisan messages on trust and trustworthiness:

HT_1A**: Non-polarizing social media messages from misaligned politicians result in larger gains in trustworthiness among agents and in trust among principals.**

HT_1B**: Polarizing social media messages from misaligned politicians result in larger declines in trustworthiness among agents and in trust among principals.**

Research suggests that individuals perceive social media platforms as conduits for increased polarization. Therefore, we expect the mean levels of trustworthiness and trust in individuals in the treatment group will be lower than in the control group. This leads to our third set of hypotheses.

HT_2**: On average, trustworthiness and trust will decline in later rounds of questioning, compared with the baseline measures.**

We also expect attention to the treatment conditions to moderate the effects of framing and cognitive dissonance. Research in political science and psychology suggests that the time spent answering a survey question is a valid measure of the respondent's cognitive effort (Berinsky, Margolis and Sances, 2014; Wise and Kong, 2005; Malhotra, 2008). The time spent reading tweets has been shown to increase the effect of the social media treatments (Banks et al., 2020). Therefore, we expect:

HT_3**: Higher engagement, such as lower latency (more time spent reading the tweets) and active engagement with the tweets ('likes,' 'retweets,' and 'replies'), will increase the effects of the treatments.**

[10]Throughout the paper we use the concepts of in-group/alignment and out-group/misalignment between voters and politicians interchangeably.

5 Descriptive Evidence: Trustworthiness and Trust

Descriptive Results for Trustworthiness

Tables 1 and 2 present descriptive information on the decision to cast the five entrusted votes (i.e., our measure of *trustworthiness*). In the first round, a total of 64% of Mexican and Brazilian respondents cast the entrusted votes, which, as noted earlier, reduced their chances of participating in the raffle. In the second round, casting rates declined to 59% and 51%, respectively.[11] Among those who agreed to cast entrusted votes in the first round, 20% in Brazil and 19% in Mexico defected in the second round. Among those who did not agree to cast votes, 22% and 15%, respectively, agreed to do so in the second round. Although casting votes reduces the chances of winning one of the prizes, most respondents still accepted their role of trustee and cast the votes of their peers as requested.

Table 1 Trustworthy, Transition Matrix (Brazil)

	Second Round		
First Round	Agree	Don't Agree	Total
Agree	51% (1213)	12% (295)	64% (1508)
Don't Agree	8% (189)	28% (666)	36% (855)
Total	59% (1402)	41% (961)	100% (2363)

Table 2 Trustworthy, Transition Matrix (Mexico)

	Second Round		
First Round	Agree	Don't Agree	Total
Agree	51% (1188)	13% (307)	64% (1495)
Don't Agree	5% (129)	31% (722)	36% (851)
Total	56% (1317)	44% (1029)	100% (2346)

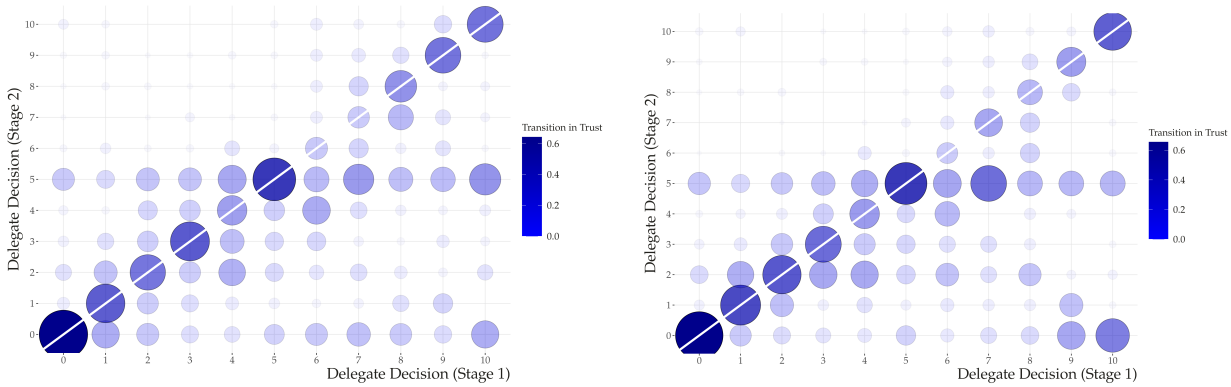
[11] We do not analyze the third round of the game here. However, trustworthiness in both countries remained almost unchanged in the third round.

Descriptive Results for Trust

Figure 3 presents descriptive results on the number of votes [0,10] entrusted to others, with the first round shown on the horizontal axis and the second on the vertical. The circles in Figure 3 describe the share of votes entrusted in the second round conditional on the respondent's decision in the first round. For example, the circles plotted on the diagonal of each figure represent respondents who entrusted the same amount of votes in the first and second rounds of the game. By contrast, the upper and lower triangles indicate an increase or decrease in trust.

Overall, we observe a decline in trust among respondents in our Mexican and Brazilian samples. Between the first and second rounds of the game, respondents consistently reduced the number of votes entrusted to other players and retained for themselves a larger number of votes, as can be readily inferred from the more populated lower triangle in Figure 3.

Figure 3 Trust: First and Second Rounds of the Game, Compared



a) Brazil b) Mexico

Note: The plots present changes in trust (votes entrusted) between the first and second rounds of the game in Brazil and Mexico. The upper triangle in each figure indicates the share of respondents who entrusted more votes in the second round (increase in trust), whereas the lower triangle indicates the share of subjects who entrusted fewer votes (decrease in trust).

6 Experimental Results

Descriptive evidence in the previous section shows that fewer respondents agreed to cast the votes entrusted to them (lower trustworthiness) between the first and second rounds, and smaller quantities were entrusted to other respondents (lower trust). In Brazil, deposits of entrusted votes (trustworthi-

ness) declined from 64% to 59%, and in Mexico from 64% to 56%. Similarly, entrusted votes to others (trust) in Brazil declined from 3.4/10 in the first round to 3.17/10 in the second, and in Mexico from 3.75/10 in the first to 3.24/10.

It is worth emphasizing that almost two-thirds of the respondents agreed to deposit the requested votes, while only a third of the resources were entrusted to others. The asymmetry between being trustworthy and distrusting others is very relevant and underscores different mechanisms for explaining these two behaviors.

The following two subsections show that, among the treated respondents (2/3 of respondents), social media exposure had no measurable effect on trustworthiness but a statistically significant effect on trust compared to the control group (1/3 of respondents).

6.1 The Null Effect of Social Media Exposure on Trustworthiness

Table 3 presents our findings on the effect of social media exposure on trustworthiness. We estimate benchmark linear probability models to capture the effect of exposure to social media messages on the binary decision to cast votes entrusted by another player in the second round of the game. In the second round, our models interact exposure to the treatment with the subjects' first-round decision. Columns 1 to 3 present the results for Brazil, while columns 4 to 6 present those for Mexico. The baseline condition includes respondents who played the second round of the game without being exposed to social media messages. We then separate by treatment condition (partisan/non-partisan and in-group/out-group) and control for the first-round decision to cast votes.

In all, the estimates do not reject the null hypotheses in HT_1A and HT_1B. Only hypothesis HT_2 holds, showing a decline in trustworthiness in later rounds, consistent with most in-person implementations of the *trust game*. This decline, however, is not explained by social media exposure. Therefore, contrary to our expectations, exposure to social media messages, varying the endorsement and framing of the message, does not affect the trustworthiness of respondents. Appendix D presents results without interaction with the subjects' first-round decision and also reports null findings.

While the decision to trust another person depends on how we evaluate their behavior (i.e., their likelihood of not complying with our request), the decision to be trustworthy affects our self-image and is governed by the tension between potential gains and our guilt sensitivity (Battigalli and Dufwenberg,

2007). We expect others to be less trustful as gains from deception increase, but we may consider the psychological cost of deceiving others too high. Therefore, we may expect others to be less likely to fulfill their promises even if we are not less likely to fulfill ours when tempted by rewards. The absence of a social media effect on trustworthiness is promising, as it may indicate that individuals could fear that others are not to be trusted without themselves being less trustworthy. We discuss future potential venues to further test for this possibility in the concluding section.

6.2 The Negative Effect of Social Media Exposure on Trust

Unlike the case for trustworthiness, our model results show that polarizing social media Tweets by out-group politicians reduce trust. We begin by presenting conservative estimates of the effect of our experiment on trust, separating dissonant messages (out-group politicians) and polarizing messages (negative tone). Then, we present statistical models and estimate the marginal effects of the treatments. Later, we discuss the factors that mediate the decline in trust.

Figures 4 and 5 separate the results of our experiment by out-group/in-group condition (partisan alignment) and by the polarizing/non-polarizing conditions (tone of the tweet). Separating the two treatment conditions, we find robust and statistically significant results when respondents are exposed to messages by out-group politicians (*dissonant messages*). Results are inconclusive when considering only the negative tone of the social media post (*polarizing partisan message*), as they are significant for Brazil but not for Mexico.

The upper left plot in Figure 4 visually confirms a statistically significant difference between respondents in the treatment and control groups exposed to messages from out-group politicians. The negative effect of the tweet is larger for respondents who entrusted more than four votes in the first round. Results are substantively similar but less robust in the case of Mexico (Figure 5).

By contrast, exposing respondents to tweets from politicians they support yields small effects in Brazil and null results in Mexico. In addition, the lower left plots in Figures 4 and 5 show that, compared with the control group, polarizing political messages produce a modest decline in trust in Brazil but have no significant effect in Mexico. Given that we are not considering the joint effect of an out-group politician posting a partisan tweet, the results reported in this section are very conservative.

In Table 4, we present the results using benchmark ordinary least squares (OLS) analysis to capture

Table 3 Regression Models: Treatment Effects of Framing and Endorsement on Trustworthiness

	Brazil			Mexico		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.344***	0.416***	0.462***	0.240***	0.303***	0.207*
	(0.074)	(0.082)	(0.097)	(0.076)	(0.095)	(0.107)
Trustworthiness (Round 1)	0.589***	0.591***	0.594***	0.634***	0.632***	0.634***
	(0.032)	(0.032)	(0.032)	(0.029)	(0.029)	(0.029)
Framing: Polarizing	0.035			−0.027		
	(0.036)			(0.034)		
Framing: Non-Polarizing	0.005			−0.019		
	(0.036)			(0.033)		
Out-group		−0.028			0.0005	
		(0.040)			(0.043)	
In-group		0.019			−0.030	
		(0.041)			(0.042)	
Polarizing Out-group			−0.032			−0.011
			(0.052)			(0.063)
Non-Polarizing Out-group			−0.024			0.005
			(0.050)			(0.052)
Polarizing x Trustworthiness (Round 1)	−0.021			0.013		
	(0.045)			(0.042)		
Non-Polarizing x Trustworthiness (Round 1)	−0.010			0.012		
	(0.045)			(0.042)		
Out-group x Trustworthiness (Round 1)		0.028			0.002	
		(0.050)			(0.054)	
In-group x Trustworthiness (Round 1)		−0.007			0.039	
		(0.050)			(0.052)	
Polarizing Out-group x Trustworthiness (Round 1)			0.015			0.009
			(0.065)			(0.078)
Non-Polarizing Out-group x Trustworthiness (Round 1)			0.038			−0.001
			(0.062)			(0.066)
N	2,128	1,607	1,156	2,219	1,426	1,084
Adjusted R^2	0.331	0.347	0.346	0.391	0.395	0.379

Notes: The models use benchmark OLS estimation. The dependent variable uses the decision to cast votes entrusted by other players, thus measuring subjects' levels of trustworthiness. A battery of individual-level pre-treatment controls—such as, age, income, employment, education, gender, and individual level of trust—are controlled for in all six estimations. *p<0.1; **p<0.05; ***p<0.01

Figure 4 Changes in Trust among Treated and Untreated Respondents in Brazil

Note: Plots compare changes in trust (votes entrusted to others) between the first and second rounds of the game in Brazil. Four treatment conditions are compared with the control group: the effect of a message from an out-group politician, the effect of an in-group politician, the effect of a polarizing tweet attacking opponents, and the effect of a non-polarizing tweet calling for unity. This figure does not evaluate the joint effect of out-group and partisan tone. Local polynomial lines with confidence intervals.

the treatments' effect on trust in the second round of the game. Because changes in trust are heterogeneous, as shown in Figures 4 and 5, we use an interactive linear model between the treatments and the decision to entrust votes in the first round of the game. Columns 1 to 3 present the results for Brazil of each different set of specifications, and columns 4 to 6 for Mexico.[12]

Appendix D presents similar linear models without modeling the heterogeneity of the results conditional on the first-stage levels of trust. In the models that do not consider the first-round decision to entrust votes, we cannot reject the null hypothesis that their trust behavior changes after respondents are exposed to the treatment. However, when heterogeneity is fully modeled, we detect a significant reduction in trust among participants who were more trustful in the first stage of the game. We argue

[12]The control group for all models consists of respondents who played the second round of the game without reading the social media message.

Figure 5 Changes in Trust among Treated and Untreated Respondents in Mexico

Note: Plots compare changes in trust (votes entrusted to others) between the first and second rounds of the game in Mexico. Four treatment conditions are compared with the control group: the effect of a message from an out-group politician, the effect of an in-group politician, the effect of a polarizing tweet attacking opponents, and the effect of a non-polarizing tweet calling for unity. This figure does not evaluate the joint effect of out-group and partisan tone. Local polynomial lines with confidence intervals.

that modeling the first-round decision deals correctly with the mechanical effects of our measurement choice. For example, a participant who donated a small amount in the first round, even with a negative shock in their trust behavior has little space to signal their decrease in trust in the second round. On the other side, a participant who expressed high levels of trust in the first round has a higher budget to signal changes in their willingness to trust other players after being exposed to our treatment. As in Figures 4, 5, and 6, the effect of the treatment has the expected negative effect once the first-round decision is taken into account in the interactive models presented in Table 4.

In models 1 and 4, we model the effects of the polarizing framing of the tweets for Brazil and Mexico. In models 2 and 5, we estimate the effects of reading a message from an out-group politician. We consider the vote intention of the respondent, "if elections were to take place next week," and the author of the tweet to distinguish the effect of a message posted by an in-group or out-group politician.

While we cannot reject the null hypothesis for an unmediated effect of polarizing framing on trust behavior (models 1 and 4), we find that exposure to a tweet from an out-group politician, independent of the content of the message, yields a statistically significant decrease in trust among respondents in Brazil. After being treated with a tweet from a misaligned politician, respondents decrease the votes they entrust to other players. The effect is larger for higher levels of trust in the first round, as reported in Figure 4. Although the results are substantially similar in Mexico, the magnitude of the effects is smaller. Although the interaction term is not statistically distinct from zero, even for the Mexican case, reading a tweet from a misaligned politician has a negative marginal effect on trust.

Finally, models 3 and 6 evaluate hypotheses $H1_A$ and $H1_B$, with respondents playing the role of principals (voters). We estimate the effects of being exposed to a partisan message sent from an out-group politician. Results in both countries show statistically significant declines in trust after respondents are exposed to polarizing partisan social media messages from political opponents. These interactive effects help us understand the null results in models 1 and 4. A polarizing framing only reduces trust behavior when associated with an out-group politician; in-group polarizing content has a null effect on participants' later trust decisions.

Results are fully described in Figure 6, with marginal effects for two of our treatment conditions from models 3 and 6. Results describe the marginal change in the number of votes [0,10] entrusted in the second round as a function of trust in the first round. Figure 6 presents the effects of reading a tweet from a misaligned politician (models 2 and 4) and Figure 7 separates the out-group treatment according to the non-polarizing and polarizing tone of the tweet (models 3 and 5). The figures clearly show how out-group polarizing messages reduce interpersonal trust behavior. For both cases, we see that reading a polarizing message from an out-group politician reduces by almost 10% the votes entrusted to other players between the first and second stages of the trust game on respondents who, in the early stage of the game, exhibited higher levels of trust. These effects become statistically significant compared to the control group as trust in the first stage increases. The effect is substantively significant and, more importantly, describes a low-dosage treatment (one tweet) compared with the large number of tweets that users are exposed to on a daily basis.

However, it is also possible to see that the effect of the treatment is larger in Brazil. An analysis of the respondent's affective response to the tweets in Brazil and Mexico shows similar angry reactions.

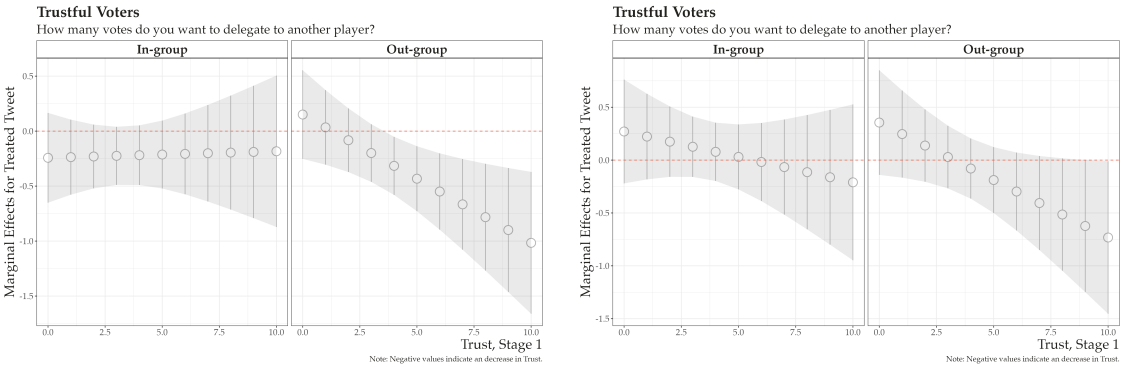
Table 4 Regression Models: Treatment Effects of Framing and Endorsement on Trust

	Brazil			Mexico		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	2.276***	2.037***	1.985***	2.514***	2.114***	2.322***
	(0.433)	(0.481)	(0.575)	(0.444)	(0.552)	(0.612)
Trust (Round 1)	0.460***	0.460***	0.460***	0.459***	0.462***	0.462***
	(0.031)	(0.031)	(0.031)	(0.032)	(0.032)	(0.032)
Tone: Polarizing	−0.052			0.299		
	(0.194)			(0.209)		
Tone: Non-Polarizing	−0.006			0.150		
	(0.195)			(0.204)		
Out-group		0.101			0.300	
		(0.216)			(0.264)	
In-group		−0.315			0.266	
		(0.217)			(0.261)	
Polarizing Out-group			0.083			0.676*
			(0.283)			(0.366)
Non-Polarizing Out-group			0.110			0.015
			(0.274)			(0.324)
Polarizing x Trust (Round 1)	−0.032			−0.050		
	(0.043)			(0.046)		
Non-Polarizing x Trust (Round 1)	−0.033			−0.039		
	(0.044)			(0.045)		
Out-group x Trust (Round 1)		−0.104**			−0.081	
		(0.048)			(0.057)	
In-group x Trust (Round 1)		0.022			−0.041	
		(0.050)			(0.058)	
Polarizing Out-group x Trust (Round 1)			−0.126**			−0.164**
			(0.062)			(0.079)
Non-Polarizing Out-group x Trust (Round 1)			−0.081			−0.018
			(0.062)			(0.069)
N	2,092	1,583	1,140	2,216	1,425	1,083
Adjusted R^2	0.232	0.234	0.218	0.200	0.196	0.202

Notes: The models use benchmark OLS estimation. The dependent variable uses the number of votes subjects (principals) entrusted in round 2 to another player to be doubled and cast for the principal's candidate. A battery of individual-level pretreatment controls—such as, age, income, employment, education, gender, and individual level of trust—are controlled for in all six estimations. *p<0.1; **p<0.05; ***p<0.01

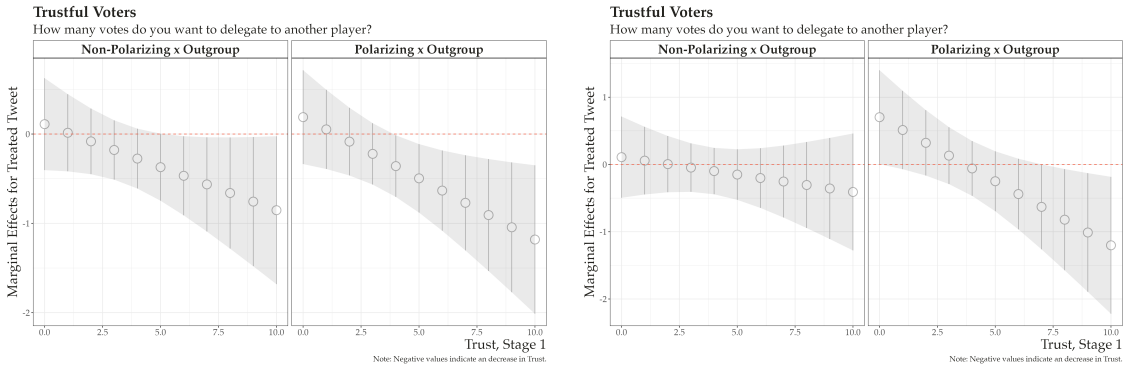
Therefore, in the next section, we explore in greater detail the mechanisms that explain differences in the decline in trust across both countries.

Figure 6 Marginal effects of source cue from Tweets on trust



a) Brazil b) Mexico

Figure 7 Marginal effects of the partisan treatment from a misaligned politician



a) Brazil b) Mexico

7 Mechanisms: The Role of Attention and Engagement

While results from the previous sections confirm the hypothesized effect of social media frames on trust, they provide limited information about the mechanisms that underlie our results or about the differences observed between Brazil and Mexico. Our survey, however, included validation checks to evaluate whether respondents properly interpreted the partisan leaning of the social media frames and, more importantly, questions about respondents' engagement with the partisan treatments. In this section, we analyze these results in greater detail, introducing a double-identification strategy that isolates the effect of attention to social media on declines in trust.

Consider the effect of the treatment among respondents who engaged with the political tweets (by

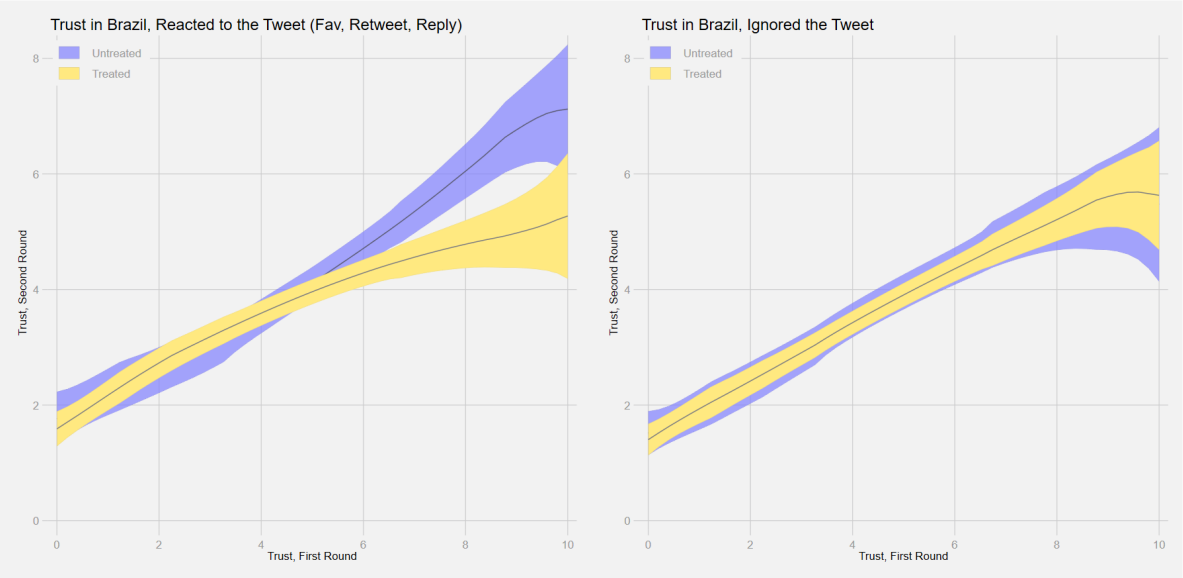
retweeting, liking, or replying) ***before*** answering our trust question (treatment group), compared with those in the control group who engaged with the tweet ***after*** answering the trust question. Given that the treatment consists exclusively of manipulating whether respondents play the trust game **before** or **after** reading the social media messages, our double-identification assumption only needs to assume that respondents assigned to the control group would have engaged with the tweet in the same way if they had been in the treatment group and not answered the trust question before engaging. We believe this is a reasonable assumption that allows us to identify the heterogeneity of the treatment effects conditional on behavioral reactions to the social media message.

Throughout this section, we repeat the same double-identification strategy (engaged treatment/engaged control, ignore treatment/ignore control) to isolate the mechanisms that explain a decline in trust. Consider Figure 8, which, as in the previous section, plots the trust decision in the second round (vertical axis) against the decision in the first round (horizontal axis). In Figure 8, the left plot compares the effect of the *treated-engaged* group (like, retweet, reply) against the *control-engaged* group. Meanwhile, the right plot describes the *treatment/ignore* group against the *control/ignore* group. Notable is the significant decline in trust among respondents who like, retweet, or reply to a tweet in the treatment group compared with respondents in the control group who were equally engaged with the tweet. Equally important is the fact that those who ignore the tweet are almost indistinguishable between groups.

Results are revealing, showing a significant decline in trust only among respondents who engaged with the tweet ***before*** the second round (treatment), and null effects for respondents who engaged with the tweet but did so ***after*** the second round (control). In other words, if we consider only respondents who felt strongly about the tweet, the effect is large and significant only for the treatment group. By splitting the sample between those who engage with the tweet (treatment and control) and those who did not (treatment and control), we prove hypothesis HT_3 and are able also to test for the different mechanisms that explain the decline in trust.

Figure 9 depicts similar two-way comparisons, focusing on messages from out-group politicians (dissonant trait). We see larger treatment effects among those who like, retweet, or reply to the message (left plot). By contrast, incidental exposure (Boczkowski, Mitchelstein and Matassi, 2018) to the tweet, as shown in the plots to the right of Figure 9, has modest effects in Brazil and a null effect in Mexico. Indeed, conditioning on both treatment and attention provides the strongest evidence yet of the effect

Figure 8 Changes in Trust When Respondents Engage with the Tweet (left) or Ignore It (right)

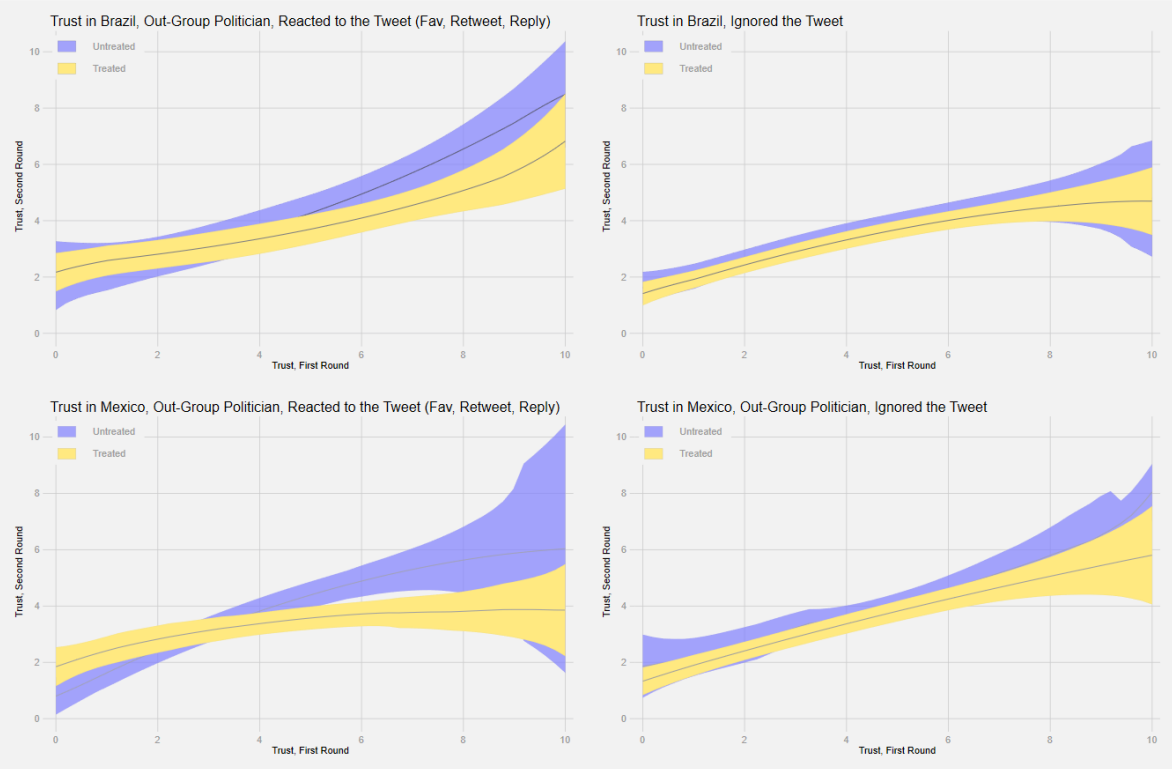


Note: The left plot estimates the treatment effect among voters who engaged with the tweet (like, retweet, or reply). The right plot estimates the treatment effect among those who did not engage (ignore). Results show a decline in trust only among respondents who saw and engaged with the tweet *before* the second round of the experiment. Those who engaged with the tweet *after* the experiment showed no decline in trust. We also find no effect among treatment and control respondents who ignored the tweet.

of social media on trust. These differences are statistically significant at conventional levels, as shown in Appendix D. Using a linear parameterization of the treatment effects, the effects of exposure to an out-group message and to our treatments overall only affect trust behavior of users who reacted to the tweets, as presented in Figures 8 and 9. As shown in Appendix D, Tables 5 and 6, these differences are statistically significant at conventional levels. The comparisons between treatment and control groups with respondents who reacted or ignored our social media treatments are illuminating of how engagement, a crucial feature of the social media era, magnifies the declines of trust.[13]

[13] Again using our formal model in Appendix B, given that all other parameters are held constant, we can confidently state that $\theta^*_{j,R1} - \theta^*_{j,R2} < 0$.

Figure 9 Changes in Trust When Respondents Engage with Dissonant Tweets



Note: The left plot estimates the treatment effect among Brazilian and Mexican voters who engaged with the tweet (like, retweet, or reply). The right plots estimate the treatment effect among those who ignore the tweet. Results show large declines in trust for dissonant tweets only among treated respondents who engaged with the tweet *before* the second round of the experiment. There is no effect for partisan dissonance in the control group and no difference in the treatment and control respondents who ignored the tweet.

8 Concluding Remarks

Is polarization on social media reducing interpersonal trust and trustworthiness?[14] Results from our survey experiment provide compelling evidence that social media has no effect on trustworthiness and that it has a negative effect on trust behavior.

The absence of a negative effect of social media exposure on trustworthiness is a welcome finding that warrants emphasis. Almost two-thirds of the respondents agreed to deposit the entrusted votes as requested, a decision that, while contrary to their personal interest, is socially desirable. The high number of individuals willing to act upon their peers' requests contrasts sharply with the number of individuals entrusting votes to others. This result indicates that our respondents were likelier to act as

[14] See the recent meta-analysis by Lorenz-Spreen et al. (2023).

"good" representatives than to trust others to do the same. The asymmetry between trustworthiness and distrusting others is significant, especially considering that a lack of trust may persist even if politicians prove themselves trustworthy representatives of their voters.

Polarizing messages from out-group politicians reduce the propensity of survey respondents to entrust votes to their peers. As such, social media could be affecting political trust by activating partisan identities, even though these partisan identities are orthogonal to the game being played (candidates in the game are fictional, and respondents do not know the partisanship of other respondents). Importantly, social media could also be affecting interpersonal trust. The implications it could have for understanding the role of social media in collective action and accountability, hence also indirectly on political trust, are left open for future research.

The negative effect on trust is considerably greater among randomly treated respondents who engage with social media messages through likes, retweets, and replies. By contrast, respondents in the control group who were equally engaged showed no change in trust behavior. Together, the double-identification strategy discussed in Section 7 provides robust evidence of a social media effect on trust behavior.

We should note that we measure engagement by asking participants to indicate their behavioral reaction to the social media message rather than providing them with the option to do so as in a "real" Twitter environment. Even though recent research shows that survey-based methods measuring sharing behavior on social media are strongly correlated with behavioral data (Mosleh, Pennycook and Rand, 2020), our measure of engagement lacks ecological validity. We expect researchers to improve the design in future studies by adopting more realistic environments to measure behavioral reactions using survey experiments.

We also find no evidence of a social media effect on trustworthiness. After exposure to polarizing social media messages, respondents are less likely to entrust resources to others but no less likely to cast votes entrusted to them. This finding is particularly relevant given the common disenchantment with their representatives among Latin American voters. One possibility is that the result is affected by our design. Politicians (agents) have only the choice of casting the votes or not; they cannot decide how many to cast, as is usually the case in traditional trust games.

Interesting extensions of the proposed model could be deployed to understand why social media

exposure decreases trust but has negligible effects on trustworthiness. Indeed, results are consistent with social media reducing the association between beliefs about my peers' trust and the guilt of letting others down. Recent research by Corbacho et al. (2016) has shown that individuals who perceive others as corrupt are more likely to engage in corruption themselves. By contrast, our experiment finds no equivalent association between perceiving others as deceitful and behaving deceitfully. Therefore, the dissociation between trust and trustworthiness in the treatment group raises new questions to be explored in future work.

In our view, implementing the proposed trust game as a survey experiment in two countries was a success. We find consistent estimates of trust behavior that are readily comparable across the two cases, with a design that allows us to determine the quality of the treatment (i.e., stronger in Brazil than in Mexico) and the importance of the mediating factors involved (i.e., engagement). We believe that the survey design can be easily replicated and used to explore differences within and across countries, as with the laboratory version of the traditional trust game.

Evidence has mounted that trust is important for thriving democracies and economies. Latin America and the world as a whole, however, have seen large drops in trust over the past few decades. The main drivers may be governments' failure to deal with several economic crises (and a pandemic), growing inequality, and unfulfilled expectations. Still, the quantity of information and how it is distributed also matters. Social media was expected to bring additional transparency, higher accountability, and, hence, higher political trust. Unfortunately, the evidence does not seem to bear out these expectations.

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