What Are Campaign Contributions Worth?

1 Introduction

Why do individuals contribute to political campaigns? The most obvious answer is that they contribute in order to influence policy, either by backing candidates who are favorable to their interests or by swaying already-elected officials. But this straightforward reason does not fully withstand scrutiny. It is unlikely that a \$100 contribution will change a politician's policy preferences or swing an election outcome, especially compared to the amount spent by large donors—Koch Industries spent approximately \$12 million on direct contributions in 2018,[1] and including the rest of the Koch political apparatus brings that total up to a shocking \$400 million.[2] Furthermore, Ansolabehere et al. (2003) argue that most individuals do not even try to maximize the amount they donate and that overall contributions are small compared to the size of the government programs that would in theory be "captured" by campaign contributions. Instead, individual-level donations seem to be a social phenomenon. Perez-Truglia and Cruces (2017) find that donations rise in response to perceived visibility by own-party neighbors, suggesting that campaign contributions are more of a costly signal than an effort to influence policymaking. This is not to say that campaign contributions are worthless: they are often used as inputs in predictive models of election outcomes,[3] and Gilens and Page (2014) find evidence that policy reflects the goals of special interest groups. The contrast between the effectiveness of small and large donations raises two important questions: could the power of small donations be increased, and if so, would small donors see their contributions as political tools rather than mere social signaling?

To address the first question, we turn to a mechanism proposed in Buterin et al. (2018)—liberal radicalism. Under this proposal, given a contribution c_i from individual i, the overall funding amount is given by $(\sum_i c_i^{1/2})^2$, a kind of inverted L2 norm the authors call the "liberal radical," rather than the usual $\sum_i c_i$. This has the effect of magnifying the power of small contributions—10 individuals contributing \$1 would produce \$100 in contributions, while one individual contributing \$10 would only produce \$10. Because this mechanism often requires outside funding, i.e., the output of the liberal radical exceeds the sum of the contributions, the work also describes a "capital-constrained" variant in which the output is $\alpha \left(\sum_i c_i^{1/2}\right)^2 + (1-\alpha) \sum_i c_i$, meaning that the excess revenue needed can be scaled using α. The authors propose this mechanism as a broad solution to the public goods problem and specifically include campaign finance as one area of application.

Such a proposal would, in theory, have two effects. First, it would make small donations more valuable. While this follows directly from the mechanical details of the proposal, it is not as clear whether the amount of small donations would increase. Even setting aside concerns about whether individuals will internalize this

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[1]A full spending breakdown is available at https://www.opensecrets.org/orgs/summary.php?id=d000000186
[2]As discussed in this article: https://www.bbc.com/news/world-us-canada-44385053
[3]See Section 2.2 for an example.

change, if the motivation for contributing to political campaigns is purely social, these new incentives will not affect social perceptions and therefore will not increase campaign contributions. Second, according to the proposal's authors, it would result in more optimal levels of funding for particular candidates and thus, assuming that campaign funding does in fact influence electoral results, better elected officials. Naturally, this hypothesis is even more difficult to test, since it relies not only on the first effect changing the distribution and amount of money contributed by each individual but also individuals' ability to back the best candidates, some level of imperviousness to cheating, and the power of campaign finance to change results.[4]

In light of these difficulties, this proposal lays out an approach to examining the first effect, a challenging task in and of itself. We propose an experiment that replicates and broadens Perez-Truglia and Cruces (2017) by comparing donation behavior under current campaign finance policy to behavior under liberal radicalism. Through this approach, we test whether liberal radicalism can "get off the ground" and inspire a change in campaign contributions. The remainder of the proposal proceeds as follows. In Section 2, we describe important results in campaign finance literature, including some seminal results on the effects of campaign finance but focusing on the motivations for individual contributions. We also include some discussion of contribution-matching in charitable giving and other applications of liberal radicalism. Section 3 gives an overview of data sources we would expect to utilize, Section 4 lays out in detail this proposal's hypotheses and experimental design that would be used to test them, and Section 5 discusses anticipated results and potential interpretations. Finally, Section 6 concludes and offers directions for future work. Further experiment details are included in Appendix A.

2 Literature Review

2.1 Motivations for Campaign Contributions

Well before the U.S. Supreme Court's 2010 *Citizens United v. FEC* decision, which prompted the rise of super PACs, Tullock (1972) raised the question, "Why is there so little money in U.S. politics?" In an age of vastly increased campaign contributions, this question may seem less relevant, but the general trends Tullock identified still exist. In 1972, total campaign spending was about $200 million, while the public expenditures that could be captured were clearly three or four orders of magnitude larger. Ansolabehere et al. (2003) discuss similar phenomena, noting that defense firms spent about $10 million in campaign contributions while defense contracts totaled over $100 billion, oil and gas contributions were around $20 million while Department of Energy subsidies are about $2 billion, and agriculture contributions were $3

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[4]Some of these conditions may not be necessary if the current levels of contribution and electoral outcomes are in fact socially optimal, but it is unlikely that this is in fact the case.

million compared to $20 billion in subsidies. The authors note that there are two potential interpretations of these facts: they can be seen as evidence that political contributions are smaller than they ought be if contributors were looking for returns, or as evidence that contributions are small precisely because they are not an effective investment. We discuss the second theory in Section 2.2 and turn to further evidence of the first.

The work of Perez-Truglia and Cruces (2017) is a direct inspiration for this proposal. Their study examines the role of social norms in shaping contribution behavior by sending letters to individuals prior to the 2012 presidential election and tracking their contribution behavior via the Federal Election Commission's (FEC) database. They find that making individuals' contributions visible to their neighbors—by including information on how to look up neighbors' contributions and announcing that everyone in a given area has received this contribution—increases donations, and that this effect only exists as a reaction to own-party neighbors. This result emphasizes the social signaling value of campaign contributions, but also includes some support for the investment view: if an individual has more own-party neighbors and is shown data on their contributions, they behave as "free-riders" and are less likely to contribute themselves.

Most work on campaign finance has focused on its effectiveness, reasoning that identifying a weak effect on actual policy would provide a satisfactory answer to Tullock's puzzle. However, Perez-Truglia and Cruces's approach is much more in line with a growing body of literature on voting and political identity, which sees these actions in a social context as well as a policymaking one. For instance, Gerber et al. (2008) used neighbors' voting behavior to increase turnout, and in DellaVigna et al. (2016), an experiment revealed the importance of image concerns for voting behavior. In this proposal, we suggest a continuation of this growing tradition of behavioral political economy that looks deeper at the relationship between the mechanisms by which people participate in politics and their willingness to take political actions.

2.2 Effects of Campaign Contributions

The literature on the effectiveness of campaign finance is extremely broad, and efforts to quantify the effectiveness of spending faces a major identification problem—better candidates are more likely to receive more funding. Popularly, campaign finance is believed to be a major factor in shifting electoral outcomes, and it is even used as an input in some highly successful election-prediction models, e.g., FiveThirtyEight's predictions for the 2018 U.S. midterm elections.[5] However, attempts in the political economy literature to isolate this effect have yielded more mixed results. Given the depth and breadth of the literature, we focus on the most seminal papers to give a sense of broad results rather than focusing on particular offices or

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[5]Its influence is described, e.g., in https://fivethirtyeight.com/features/election-update-how-the-latest-fund raising-numbers-shifted-our-house-forecasts/

issues.

Several papers begin with a theoretical approach that models campaign finance in the context of bargaining equilibria. Grossman and Helpman (1994) famously discuss a model in which trade policy is almost entirely determined by special interests through the manipulation of economic incentives. The same authors also describe a wider range of similar cases in their book, *Special Interest Politics* (2000). Bombardini and Trebbi (2011) describe an inverse-U-shaped effect between the size of a special interest group and its campaign contributions. In a bilateral bargaining model, this relationship is driven by the tradeoff between a larger group simultaneously offering more surplus and substituting promises of votes for money. Using FEC data, the authors estimate structural equations that place the price of a single vote at \$145. Campante (2011) provides a model in which individuals decide which party to vote for and how much to contribute to a campaign. In this model, even small campaign contributions endogenously create wealth bias in parties' redistribution policies under the assumption that contributions are able to increase turnout of a party's supporters. Campante provides stylized facts using FEC data to provide some intuition to support this prediction.

On the empirical side, Levitt (1994) finds almost negligible effects of campaign finance by looking at repeat challengers in U.S. House races to implicitly control for candidate fixed effects, but it is unclear whether his sample is large or varied enough for that result to have much relevance. Ansolabehere et al. (2003) summarize literature on the effect of campaign contributions, both directly referencing earlier results and re-estimating effects using a variety of more modern empirical techniques. Across the board, they find that legislators' own beliefs and party are far more influential in determining policy than campaign contributions, with the effects differing by over an order of magnitude. However, this result comes before the *Citizens United* decision and does not address the question of whether campaign finance affects the politicians who are elected in the first place. This alternative mechanism, in which legislators' preferences are largely fixed and citizen input (either from voting or campaign contributions) can only change which candidate is elected, not what they will do once they are, is termed the "elect" theory in political economy literature. It has ample empirical support, e.g., Lee et al. (2004) and Button (2017), despite some evidence that it is weaker (and citizen power to shift voting behavior of already-elected representatives is stronger) in the case of more well-known political figures and events, e.g., Mian et al. (2010) and Albouny (2011).

More tangentially, Gilens and Page (2014) use detailed opinion data on approximately 2,000 unique policy changes that contains respondents' income alongside information on interest-group positions to test the relative effects of average citizens, economic elites, and special interests on policymaking. They find strong evidence that the preferences of economic elites and special interest groups dominate policy decisions. While this is not direct evidence of the influence of campaign contributions, it is suggestive, since that

channel is one that is much more readily available to the wealthy or well-organized than to average citizens.

Overall, the literature on the effectiveness of campaign finance tempers the popular narrative that more money almost inevitably boosts electoral chances, but does provide some evidence that especially large donations or those that come backed by the power of an interest group can be particularly influential. These results suggest that while the amount of money contributed may not be a key determinant of electoral chances or policymaking, the relationships and levels of access granted by large donations do play a role, echoing some of the results in the literature on lobbying, e.g. Blanes-i-vidal et al. (2012) and Bertrand et al. (2014), who both find that a lobbyist's connections are more valuable than their expertise. In light of this weak link, the effects of liberal radicalism on voter engagement are made even more important, while the potential to directly and dramatically change election outcomes appears reduced.

2.3   Contribution Matching

While liberal radicalism in its fullest form would re-imagine the effects of individual contributions altogether, the capital-constrained version in particular can be viewed as an unorthodox instance of contribution matching. There is extensive literature on how promising to match individuals' charitable contributions affects their giving behavior. Theoretically, matching increases the marginal value of each dollar, but could also crowd out giving.[6] Experimentally, Eckel and Grossman (2003) is the seminal paper; the authors show in a laboratory experiment that while contribution matching and rebates can be calibrated to have equal effects on marginal utility, matching encourages significantly more donations. However, the amount contributed as a percentage of out-of-pocket income does not increase with the matching amount. Eckel et al. (2005) also use a laboratory setting to study matching, finding that while reserving a portion of subjects' income does not cause crowding out—they donate the same amount even when the reserved amount increases—framing that same action as taxation results in near-complete crowding out.

Bridging laboratory experiments and real-world manipulations, Rondeau and List (2008) compare the results of matching and "challenge" contributions—pre-committed amounts, e.g. "Bill Gates has already pledged $1 million to our cause, help us reach our $2 million goal"—in soliciting Sierra Club donations. They find that both increase donations, but the challenge contribution is more effective and the increase from matching is not statistically significant. Having identified a strong "threshold effect," where contributions tracked the flyer's identified fundraising target, they prepared a laboratory experiment featuring matching and challenge conditions, as well as varying thresholds below which contributions would not be accepted and would instead be refunded. The threshold effect persisted, as did the statistical insignificance of matching, but the effect of challenge contributions also became statistically insignificant. In contrast, Eckel and Grossman

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[6]As discussed in, for instance, the *Handbook of Public Economics*, ch. 1, by Andreoni and Payne.

(2008) compare equivalent matching and rebate schemes in Minnesota Public Radio fundraising drives with similar approaches in a lab experiment and find similar results. In both cases, the matching fund was more successful at increasing the amount collected, though it did not increase out-of-pocket giving; the amounts given were similar in the field and lab experiments.

Several other papers use field experiments to examine the real-world effects of matching schemes. Karlan and List (2007) is a seminal paper in this field. The authors partner with a nonprofit and announce one of three matching schemes—1:1, 2:1, or 3:1—in conjunction with one of three maximum amounts provided by the matching fund—$25,000, $50,000, or $100,000. All matching schemes increased the extensive margin of whether to donate and the intensive margin of how much to donate out-of-pocket—in contrast to Eckel and Grossman (2008)—but there was no difference among the three; the cap on the matching fund's total contributions had no effect on donations. Karlan et al. (2010) conduct a similar study comparing 1:1 and 3:1 matching schemes. As in Karlan and List (2007), there is no significant difference between them, and as in Eckel and Grossman (2008), out-of-pocket contributions do not increase over the whole sample. However, out-of-pocket contributions do increase among those who had donated recently, and do so somewhat more in the 3:1 matching case; this is offset by the relatively small size of that sample and a slight decrease in contributions by "lapsed" donors. Finally, Huck and Rasul (2011) conduct a field experiment among opera patrons in Germany. They compare a control group who is simply asked for donations to a group that is told of a challenge gift and two more groups that are told of the challenge contribution and presented with either 0.5:1 or 1:1 matching schemes. They find that announcing the challenge contribution increases average contributions relative to the control regardless of matching, but that while both matching schemes increase net giving—the 1:1 by more—they reduce out-of-pocket giving compared to the challenge contribution alone.

The mixed results in this literature suggest that if individuals view liberal radicalism as a matching scheme, they may not respond in the desired way. Indeed, it may be that individuals actually contribute slightly less in comparison to the status quo. However, two results from this literature bode well for this study and liberal radicalism in general. First, the budget of the matching fund appears to have a small effect, if any, on contribution behavior. One of the major challenges of a true matching program would be its sizable cost; however, to obtain results indicating the effects of liberal radicalism, it would likely be sufficient to examine a strictly capital-constrained version. We discuss the pros and cons of a true, no-deception matching program and a survey-based approach with hypothetical questions further in Section 4.2. Second, and perhaps more importantly, the goal of liberal radicalism is not to increase the net amount contributed to political campaigns, but rather to diversify the contribution base and give more power to small contributions. Thus, even if the intensive margin sees a decrease in the amount contributed, this could be offset politically by an increase in the extensive margin of who contributes at all.

2.4 Liberal Radicalism

Buterin et al. (2018) introduces the liberal radical as a solution to public-goods problem, but draws on earlier results using similar quadratic-function mechanisms for opinion aggregation. Individuals derive utility that is quasi-linear in money from a given level of a public good. Both what the authors call "Capitalism," which provides funding according to the sum of individual contributions, and "one-person, one-vote," which provides funding according to the median choice, do not achieve optimal funding. In contrast, liberal radicalism, which applies the mechanism described in Section 1, precisely sets the marginal utility of the public good equal to the marginal cost to an individual of providing more funding, and thus reaches the optimal level. The authors explain that when such a mechanism is deficit-funded, it does not exactly produce optimal funding, but comes relatively close, and emphasize that in the presence of sophisticated collusion, the mechanism may break down. They propose two variants of the core mechanism—one that allows for negative contributions as well as positive ones, and the capital-constrained one described in Section 1 and suggest potential applications to campaign finance, open-source software, media subscriptions, and public works.

Buterin et al. draw heavily on Weyl's (2012) proposal of "quadratic vote buying," which applies a similar logic to suggest a system in which rather than assigning each citizen one vote, citizens can purchase additional votes at quadratically increasing cost. This idea also appears in Weyl's book with Eric Posner, *Radical Markets: Uprooting Capitalism and Democracy for a Just Society*, as well as multiple publications with various coauthors, e.g., Weyl and Lalley (2018) and a 2017 special issue of *Public Choice*. These works lay out theoretical results about the accuracy of quadratic mechanisms in large populations and seek to show that such a mechanism is both more effective in actualizing societal preferences and less vulnerable to particular failures such as tyranny of the majority than one-person, one-vote systems.

Of particular interest is the only prior experimental implementation of such a quadratic mechanism, in Quarfoot et al. (2017). The authors study a variant of quadratic vote buying where participants are allocated a budget of "vote credits" that they use to purchase votes across different issues, with the cost increasing quadratically. To illustrate, with a budget of 100 vote credits and 4 issues to vote on, an individual could cast 10 votes on one issue (at a cost of $10^2 = 100$ credits) and none on the other three, 5 votes on each of the four issues (at a cost of $5^2 = 25$ credits per issue), or some other distribution of credits. Rather than implementing this system for electoral purposes, Quarfoot et al. use it as a survey tool and show that preferences under this survey format exhibit a normal distribution rather than the "W-shaped" clustering at the extremes that is common in Likert scales. They argue that the quadratic voting survey allows survey designers to more accurately determine which issues are truly important to survey-takers.

The dearth of experimental literature on quadratic mechanisms is perhaps unsurprising given that they can be expensive to fully implement. However, Quarfoot et al. (2017) suggests that despite their apparent complexity, experimental subjects are willing to engage with the mechanism and that it does produce a markedly different result. While our experiment faces the same challenges with regard to funding as many of the proposals in Buterin et al. (2018), the success of the quadratic voting survey bodes well for a potential "hypothetical approach" discussed in Section 4.2. We hope to contribute to the growing literature on real-world tests of mechanism design, and quadratic mechanisms specifically, by laying the groundwork for significant policy change.

3   Data

The FEC maintains a database of individual campaign contributions exceeding $200, which is also available in a cleaner format from the Center for Responsive Politics. This data includes the contributor's name, employer, and address; the contribution amount, date contributed, type of election, and candidate to whom the money was contributed; and additional administrative information. Even including only those for whom zip code information is available, we are left with a number of individuals in the hundreds of thousands. We partition them into three-digit ZIP codes following Perez-Truglia and Cruces (2017); these are our units of analysis and each will receive one of the fifteen conditions resulting from the five-by-three set described below. Using the FEC data, we can compute various metrics of the amount of donations in a district, namely the average donation amount, both overall and for each party, as well as the proportion of donations and proportion of the total donated amount given to each party. Using these metrics, we can find the average donation averaged across all 3-digit ZIP codes, which gives a ballpark for the amount that would be needed to implement a full-scale liberal radical system.

To supplement this data and provide demographic and political control variables, we take advantage of general socioeconomic data from the American Community Survey (ACS) via Social Explorer[7] and electoral results from CQ Press, which presents official election totals in machine-readable format.[8] Neither of these results are tabulated at the ZIP code level; however, the Census Bureau's Zip Code Tabulation Areas (ZCTAs) are near-perfect matches for ZIP codes. We obtain county-level ACS and election result data and make use of the Census Bureau's county-to-ZCTA crosswalk tables[9] to approximate ZIP code data. This matching allows us to control for key confounding variables while preserving the granular detail afforded by the FEC data.

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[7] Accessed at www.socialexplorer.com
[8] Accessed at http://library.cqpress.com.ezproxy.princeton.edu/elections/
[9] Accessed at https://www.census.gov/geo/maps-data/data/zcta_rel_overview.html

4   Hypotheses and Experimental Design

The overall design of this study is a series of letters mailed to individuals approximately six months prior to a presidential or midterm election, grouped by three-digit ZIP Code, with information about campaign contributions. The letters include information according to a five-by-three matrix of conditions. The first set, which we call the first-dimension condition, is inspired by Perez-Truglia and Cruces (2017) and tests social-norms-related features of campaign contributions and the free-rider effect. The second set, which we call the second-dimension condition is entirely original and tests the effectiveness of radical liberalism. By using a matrix of conditions, we derive evidence about which motivations for contribution radical liberalism operates on. We hypothesize that radical liberalism will have a minor effect, if any, on norms-based motivations for contribution, but will largely eliminate free-riding, and directly increase contributions by enhancing the previously dominated personal investment motivation.

The first-dimension condition implements one of four interventions or a placebo with no socially relevant information. The first pair, drawn from Perez-Truglia and Cruces (2017), compares those told that their neighbors are receiving information about how to look up contributions to those who are not. The second pair, which modifies a general approach from that same work, compares those who are given information about own-party contributions and those who are not. The second-dimension condition implements one of two interventions or a placebo that only discusses current individual contribution limits. One intervention describes liberal radicalism, and the other emphasizes the ability to make unlimited contributions through super PACs.

By grouping individuals geographically, we allow analysis that focuses on the partisan balance of particular areas, as well as non-deceptive experimental practices. There is some risk of geographical differences affecting the results; we attempt to minimize this through our placebo conditions, the large sample size, and the broad panel of political and demographic controls we include in our regression estimates using the data described in Section 3.

4.1   Social Motivations for Contribution

We test for social motivations primarily through the first-dimension conditions. Moving forward, we follow the labeling of Perez-Truglia and Cruces (2017) and identify these as "Website-Self," "Website-Neighbors," "List-Neutral," "List-Own," and use w as an indicator variable for the Website-Neighbors condition and ℓ as an indicator variable for the List-Own. Recall that the primary goal of the first-dimension conditions is to allow analysis of the channels through which liberal radicalism may affect contributions; as such, we choose not to "reinvent the wheel" and follow Perez-Truglia and Cruces (2017) closely for the format of these

interventions. In the Website-Self and Website-Neighbors condition, we include example contributions drawn randomly to contain one Democratic contribution and one Republican contribution, as well as information about the ability to look up contributions online. The Website-Self letter states that the chosen household was the only one to receive such a letter, while the Website-Neighbors one states that other households in the neighborhood received the same letter as well; both of these are non-deceptive because of our geographic grouping. The placebo letter, which is constant across both dimensions includes information on campaign contribution limits taken directly from the FEC website.

Because we want to focus on whether contributions decrease when the share of own-party contributions rises—a free-rider effect—our List letter differs somewhat from the more broad approach used by Perez-Truglia and Cruces. To generate the letter, we first split contributors in a given geographic unit by party, and rank their contributions by closeness to the mean. Then, the List-Neutral condition receives information on five contributions from the Republican subset and five from the Democratic subset, while the List-Own receives information on eight contributions from the party that matches their own previous contribution and two from the opposing party. All contributions are drawn with a probability that increases with rank order. Rather than simply including a number of contributions from each party proportionate to the geographic unit's partisan lean, we implement this randomization to protect against exogenous characteristics that drive both partisan lean and contribution behavior. The goal is that, on balance, geographic units in the List-Neutral condition will be politically and demographically similar to those in the List-Own condition, and thus suitable for experimental comparison.

Appendix A describes the proposed information presented in each condition in more detail. We now turn to the regression equations we estimate. Indexing geographic units by i and letting π_i be the share of own-party-identified residents in i, we estimate two equations for C_i, a measure of contributions:

$$C_i = \alpha_0 + \alpha_1 w_i + \alpha_2 w_i \cdot \pi_i + \alpha_3 \pi_i + \alpha_4 X_i + \epsilon_i \tag{1}$$

$$C_i = \beta_0 + \beta_1 \ell_i + \beta_2 \ell_i \cdot \pi_i + \beta_3 \pi_i + \beta_4 X_i + \epsilon_i \tag{2}$$

where, abusing notation slightly, X_i is a matrix whose columns are our control variables and, as by convention, ϵ_i is the error term; they are not common between equations, but we use the same notation for simplicity. Various sets of control variables will be employed for robustness checks, but broadly speaking we consider age, race, education, and income, as is standard in the political economy literature.

Equation (1) estimates the effect of the Website-Neighbors treatment, while Equation (2) estimates the presence of a free-rider effect. For clarity of results, the sample for Equation (1) contains only the placebo, Website-Own, and Website-Neighbors treatments, while the sample for Equation (2) contains only

the placebo, List-Neutral, and List-Own treatments. $\alpha_1 + \alpha_2 \pi_i$ and $\beta_1 + \beta_2 \pi_i$ capture the full effect of each experimental treatment, while α_2 and β_2 capture the interaction between partisan lean and the treatment. As a robustness check, we can test $\alpha_2 w_i + \alpha_3 = \beta_2 \ell_i + \beta_3$, since both of these terms test for the effect of partisan lean independent of the treatment.

4.2 Effects of Liberal Radicalism

The above analysis largely replicates Perez-Truglia and Cruces (2017); on top of it, we layer our own intervention, focusing on liberal radicalism as compared to the current system of campaign finance contributions. To do so, we use the second-dimension conditions. In the placebo condition, we retain the placebo letter from Section 4.1. In what we label the "PAC" condition, we add information about the unlimited contributions permitted to super PACs in addition to the placebo letter's information about limits on individual contributions. In the "Radical" condition, the letter instead includes a description of the mechanism in Buterin et al. (2018). Here, we include two proposals for obtaining results, both of which have advantages and flaws. In the first, we include a hypothetical question asking about donations under this proposed mechanism. We can then use this hypothetical as our outcome variable alongside the actual contribution data. While this is not a like-for-like comparison, implementing the full level of matching needed to run the mechanism without deception, even for small donations, is tremendously costly, and as such, this provides a reasonable proxy.[10] Preliminary testing of hypothetical questions about campaign contributions would allow some degree of confidence that this approach will not bias the results. The second option is to include a description of and implement the capital-constrained variant of liberal radicalism. While this allows us to directly compare actual campaign contributions without leaning on a hypothetical, it drastically reduces the scope and influence of the proposal due to the limited budget and therefore underestimates its effectiveness by an indeterminate amount. Moving forward, we gloss over this potential difference in the outcome variable across treatments under the assumption that one of these two approaches, or some blend of both, is chosen.

We are interested not only in the "raw" effect of liberal radicalism compared to the status quo, but also the interaction it may have with norm-driven and free-riding contribution behavior; this interest is what motivates the layered design of the experiment. As such, we estimate two regression equations similar to those in Section 4.1, with similar goals. Using the same notation as those equations, with p_i and r_i as indicators for the PAC and Radical conditions, respectively, we estimate:

$$C_i = \alpha_0 + \alpha_1 \, r_i + \alpha_2 \, r_i \cdot w_i + \alpha_3 \, r_i \cdot \pi_i + \alpha_4 \, r_i \cdot w_i \cdot \pi_i + \alpha_5 \, w_i + \alpha_6 \, w_i \cdot \pi_i + \alpha_7 \, \pi_i + \alpha_8 X_i + \epsilon_i \qquad (3)$$

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[10]It may also be interesting to see whether *actual* campaign contributions increase even without a promise of implementation.

$$C_i = \alpha_0 + \alpha_1 \, r_i + \alpha_2 \, r_i \cdot \ell_i + \alpha_3 \, r_i \cdot \pi_i + \alpha_4 \, r_i \cdot \ell_i \cdot \pi_i + \alpha_5 \, \ell_i + \alpha_6 \, \ell_i \cdot \pi_i + \alpha_7 \, \pi_i + \alpha_8 X_i + \epsilon_i \qquad (4)$$

$$C_i = \beta_0 + \beta_1 \, p_i + \beta_2 \, p_i \cdot w_i + \beta_3 \, p_i \cdot \pi_i + \beta_4 \, p_i \cdot w_i \cdot \pi_i + \beta_5 \, w_i + \beta_6 \, w_i \cdot \pi_i + \beta_7 \, \pi_i + \beta_8 X_i + \epsilon_i \qquad (5)$$

$$C_i = \beta_0 + \beta_1 \, p_i + \beta_2 \, p_i \cdot \ell_i + \beta_3 \, p_i \cdot \pi_i + \beta_4 \, p_i \cdot \ell_i \cdot \pi_i + \beta_5 \, \ell_i + \beta_6 \, \ell_i \cdot \pi_i + \beta_7 \, \pi_i + \beta_8 X_i + \epsilon_i \qquad (6)$$

where we use the same letter for the coefficients in each set of two equations despite their being different to highlight the value of each pair: one comparing the Radical condition to the baseline (equations (3) and (4)) and one comparing the PAC condition to the baseline (equations (5) and (6)). We could rewrite this as two equations and include both indicator variables, or include a third set of equations to directly compare the Radical and PAC conditions, but this formulation both avoids added complexity and highlights the results we are looking for—the effect of reinforcing particular contribution mechanisms compared to individuals' default conceptions of campaign contributions.

4.3 Survey

We also include a survey designed to elicit information about people's beliefs surrounding campaign finance regulation that may be relevant to extend and buttress the conclusions of the experiment above. So as not to interfere with the experimental treatment, we send the survey after the end of the election cycle chosen for the experiment to a random subsample of individuals from each condition. The survey asks about contribution limits, whether contributions are public or private, opinions on liberal radicalism, and beliefs about neighbors' responses to these questions. The goal of this treatment is twofold. As in Perez-Truglia and Cruces (2017), we seek to obtain more precise estimates of response rates, since "responses" to the experimental treatments take the form of contributions recorded in the FEC database and thus may or may not be direct responses to the treatment.[11] Second, we use this as an opportunity to obtain descriptive results to complement the results of the experiment, providing a "gut check" by directly eliciting beliefs. Because the survey is sent following the experiment, it cannot serve as true a ex-ante check that the population chosen for each condition is similar—our existing data and control variables are sufficient in any case. However, it does provide clearer intuition to support our potential findings.

5   Anticipated Results

While any detailed analysis of the experimental protocol above clearly depends on the data collected and any obstacles that arise in the course of carrying it out, we present here some potential results and the

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[11]Note that this does not affect our experimental results; we are interested in the overall effect of implementing liberal radicalism, which includes the actions of those who do not change their behavior or even notice the new system.

conclusions they would imply for illustrative purposes.

With regard to the role of social motivations, we would expect Equation (1) to yield results similar to those in Perez-Truglia and Cruces (2017), namely a large positive value of α_2 that dominates the sign of $\alpha_1 + \alpha_2\,\pi_i$, indicating that contributions rise when social pressure is invoked by highlighting neighbors' ability to monitor each others' contributions. Similarly, we would expect a negative $\beta_1 + \beta_2\,\pi_i$, showing that our more explicit test of the free-rider effect confirms its existence—individuals are less prone to contribute when they believe that own-party neighbors are in effect "doing the work for them." The values of β_1 and β_2 are not as relevant here, though if β_2 dominates, this may indicate that free-riding acts by highlighting knowledge about the actual partisanship of an individual's neighborhood rather than by generating it. However, the overall effect may be tempered by the tendency to contribute more when average contributions of own-party members rise. At the risk of introducing greater multicollinearity into our equation, it may be valuable to add a term that controls for average own-party contributions to try to isolate the relevant effect. There is also some concern that the free-riding condition may actually induce social conformity instead; such a result would suggest that further investigation is needed to determine when each of the two motivations dominates.

Broadly speaking, we expect the PAC condition to have a "discouraging" effect on contributions and the Radical condition to have an "encouraging one," with the interaction terms intended to allow us to pinpoint the channels through which that effect acts. The existence of this overall effect would be confirmed by factoring p_i and r_i out of equations (3) through (6) and examining their coefficients. Using equations (3) and (4) as an example, we can walk through the meaning of the various interaction terms. $\alpha_2\,w_i + \alpha_4\,w_i \cdot \pi_i$ describes the interaction between the Radical condition and the Website-Neighbors condition, i.e., the interaction between liberal radicalism and the social norms channel. Given that liberal radicalism mechanism encourages contribution by making that contribution a better investment, not by making it more socially visible, we would expect this value to be near zero. In particular, α_4 should be near zero, since the effect of liberal radicalism is not mediated by own-party presence or visibility. Likewise, because liberal radicalism removes the incentive to free-ride, $\alpha_2\,\ell_i + \alpha_4\,\ell_i \cdot \pi_i$, which describes the interaction between liberal radicalism and the free-riding treatment, should also be near zero. These suggest that the effect should come directly and primarily from α_1, i.e., liberal radicalism itself, rather than any influence exerted through social-norm channels.

Alternatively, it may be the case that liberal radicalism functions through social channels; for instance, the increased influence of small donations may create greater social pressure to donate at the same time as it creates greater individual incentives. It may also be valuable to look at the interaction between the Radical condition and average contribution size, both own-party and opposite-party. Compared to the neutral condition, liberal radicalism encourages contributions even, or perhaps especially, when others' are

large, which would lead to a positive magnitude on the interaction term between the Radical condition and contribution size.

The effect of the PAC condition should largely mirror the effects of the Radical condition, but with opposite signs, since rather than highlighting the power of small donations, it reduces them. In this case, though, any social-norms-based pressure to contribute would work against this discouragement. Comparing the magnitude of $\beta_2\, w_i + \beta_4\, w_i \cdot \pi_i$ in Equation (5) to that of $\alpha_1 + \alpha_2\, \pi_i$ in Equation (1) would shed light on whether the PAC condition attenuates social motivations or simply strengthens the competing individual motivation not to contribute because it is a poor investment. Similarly, it could be that the PAC condition increases the incentive to free-ride if others' contributions are large, so examining the sign of an interaction term between the PAC condition and contribution size would be valuable here as well.

Taking advantage of political and demographic data, it may also be valuable to extract some stylized facts about the effects of liberal radicalism. These conclusions are not the main goal of the project, but would provide a more intuitive and communication-friendly picture of the changes implementing such a mechanism would prompt. For instance, we can plot the distribution of contribution amounts to see whether more small donations actually result, or examine donations among particular groups that are more or less politically active—those who are not registered as party members, for instance. Even if there is no clear increase in donations as a result of the Radical condition, this would bode well for more sophisticated messaging and implementation of the mechanism.

6   Conclusion

Following the 2010 *Citizens United* decision, campaign finance reform has been a political hot topic in the U.S., attracting attention as apparent proof of the political system's corruption. However, the story told by research on campaign contributions is much more mixed, painting a picture where individual contributions are not made with the primary goal of influencing outcomes and even the largest donations may not drive favorable outcomes merely by virtue of their size. This proposal seeks to provide a way forward by confirming some of these results and examining the impact of a radical campaign finance proposal intended to strengthen the power of small donors.

Our goals are twofold: first, to examine whether liberal radicalism does in fact encourage more campaign contribution from individuals, and second, to test two particularly important motivational effects in the context of campaign finance reform: social pressure and free-riding. While both of these effects have received some attention in the literature, a rapidly changing political climate makes them worthy of study in and of themselves. Combining them with analysis of campaign contribution mechanisms provides some insight into

how these effects may be influenced by broader political phenomena.

Naturally, there are some limitations to the methodology proposed here. Low rates of response to mail-in surveys require a large sample size to ensure an adequate number of respondents, and thus increase the cost of the project. This fact makes it more difficult to actually implement liberal radicalism and places a relatively low capital constraint on it. Even within the selected sample, the FEC database is limited to those who already contribute. Given liberal radicalism's focus on amplifying individual donations, studying the extensive margin—the decision to contribute at all—as opposed to the intensive margin—how much those already contributing choose to give—might give a more complete picture. While these concerns may hamper the scope of the results, they do so by biasing the estimate of liberal radicalism's effectiveness downward. In light of this, a positive finding would represent even stronger evidence that implementing liberal radicalism would change campaign contribution behavior for the better.

The experiment proposed here uses the power of administrative data on campaign contributions to test interventions in the real world, but does face significant challenges when it comes to implementing liberal radicalism. However, if it does show a concrete benefit to liberal radicalism by diversifying the contribution base, it may pave the way for more well-funded approaches that implement contribution-matching in local or even state elections. This proposal is only a first step towards testing the effectiveness of liberal radicalism, and only does so in one particular domain. Whatever the results, it will serve as a stepping stone for future attempts at reform.

Works Cited

Albouy, David. "Do Voters Affect or Elect Policies? A New Perspective, with Evidence from the U.S. Senate." *Electoral Studies* 30, no. 1 (2011): 162-73. doi:10.1016/j.electstud.2010.11.016.

"American Community Survey (ACS)." Census Bureau QuickFacts. October 11, 2018. Accessed December 21, 2018. https://www.census.gov/programs-surveys/acs/data.html.

Andreoni, James, and A. Abigail Payne. "Chapter 1 - Charitable Giving." In *The Handbook of Public Economics*, edited by Alan J. Auerbach, Raj Chetty, Martin Feldstein, and Emmanuel Saez, 1-50. Vol. 5. Amsterdam: North Holland, 2013.

Ansolabehere, Stephen, John De Figueiredo, and James Snyder. "Why Is There So Little Money in Politics?" *Journal of Economic Perspectives* 17, no. 1 (2003): 105-30. doi:10.3386/w9409.

Bertrand, Marianne, Matilde Bombardini, and Francesco Trebbi. "Is It Whom You Know or What You Know? An Empirical Assessment of the Lobbying Process." *American Economic Review* 104, no. 12 (2014): 3885-920. doi:10.1257/aer.104.12.3885.

Blanes i Vidal, Jordi, Mirko Draca, and Christian Fons-Rosen. "Revolving Door Lobbyists." *American Economic Review* 102, no. 7 (2012): 3731-748. doi:10.1257/aer.102.7.3731.

Bombardini, Matilde, and Francesco Trebbi. "Votes or Money? Theory and Evidence from the U.S. Congress." *Journal of Public Economics* 95, no. 7-8 (2011): 587-611. doi:10.1016/j.jpubeco.2010.11.018.

Buterin, Vitalik, Zoë Hitzig, and Eric Glen Weyl. "Liberal Radicalism: Formal Rules for a Society Neutral Among Communities." *Working Paper*, 2018. doi:10.2139/ssrn.3243656.

Button, Patrick. "A Replication of 'Do Voters Affect or Elect Policies? Evidence from the U.S. House' (*Quarterly Journal of Economics*, 2004)." *Public Finance Review* 46, no. 5 (2017): 886-93. doi:10.1177/1091142117721739.

"Campaign Finance Data." Federal Election Commission. December 01, 2018. Accessed December 21, 2018. https://www.fec.gov/data/.

Campante, Filipe R. "Redistribution in a Model of Voting and Campaign Contributions." *Journal of Public Economics* 95, no. 7-8 (2011): 646-56. doi:10.1016/j.jpubeco.2010.11.013.

"CQ Press Voting and Elections Collection." CQ Press. Accessed December 21, 2018. http://library.cqpress.com.ezproxy.princeton.edu/elections/.

"Data on Campaign Finance, Super PACs, Industries, and Lobbying." Center for Responsive Politics. December 01, 2018. Accessed December 21, 2018. https://www.opensecrets.org/.

DellaVigna, Stefano, John A. List, Ulrike Malmendier, and Gautam Rao. "Voting to Tell Others." *Review of Economic Studies* 84, no. 1 (2016): 143-81. doi:10.1093/restud/rdw056.

Eckel, Catherine C., and Philip J. Grossman. "Rebate versus Matching: Does How We Subsidize Charitable
  Contributions Matter?" *Journal of Public Economics* 87, no. 3-4 (2003): 681-701.
  doi:10.1016/s0047-2727(01)00094-9.

Eckel, Catherine C., Philip J. Grossman, and Rachel M. Johnston. "An Experimental Test of the Crowding
  Out Hypothesis." *Journal of Public Economics* 89, no. 8 (2005): 1543-560.
  doi:10.1016/j.jpubeco.2004.05.012.

Eckel, Catherine C., and Philip J. Grossman. "Subsidizing Charitable Contributions: A Natural Field
  Experiment Comparing Matching and Rebate Subsidies." *Experimental Economics* 11, no. 3
  (2008): 234-52. doi:10.1007/s10683-008-9198-0.

Gerber, Alan S., Donald P. Green, and Christopher W. Larimer. "Social Pressure and Voter Turnout:
  Evidence from a Large-Scale Field Experiment." *American Political Science Review* 102, no. 1 (2008):
  33-48. doi:10.1017/s000305540808009x.

Gilens, Martin, and Benjamin I. Page. "Testing Theories of American Politics: Elites, Interest Groups, and
  Average Citizens." *Perspectives on Politics* 12, no. 03 (2014): 564-81. doi:10.1017/s1537592714001595.

Grossman, Gene M., and Elhanan Helpman. "Protection for Sale." *American Economic Review* 84, no. 4
  (1994): 833-50. https://www.jstor.org/stable/2118033.

Grossman, Gene M., and Elhanan Helpman. *Special Interest Politics.* Cambridge: MIT Press, 2002.

Karlan, Dean, and John A. List. "Does Price Matter in Charitable Giving? Evidence from a Large-Scale
  Natural Field Experiment." *American Economic Review* 97, no. 5 (2007): 1774-793.
  doi:10.1257/aer.97.5.1774.

Karlan, Dean, John A. List, and Eldar Shafir. "Small Matches and Charitable Giving: Evidence from a
  Natural Field Experiment." *Journal of Public Economics* 95, no. 5-6 (2011): 344-50.
  doi:10.1016/j.jpubeco.2010.11.024.

"Koch Industries: Summary." OpenSecrets.org. December 23, 2018. Accessed December 23, 2018.
  https://www.opensecrets.org/orgs/summary.php?id=d000000186.

Lalley, Steven P., and E. Glen Weyl. "Quadratic Voting: How Mechanism Design Can Radicalize
  Democracy." *AEA Papers and Proceedings* 108 (2018): 33-37. doi:10.1257/pandp.20181002.

Lee, David S., Enrico Moretti, and Matthew J. Butler. "Do Voters Affect or Elect Policies? Evidence from
  the U.S. House." *Quarterly Journal of Economics* 119, no. 3 (2004): 807-59.
  doi:10.1162/0033553041502153.

Levitt, Steven D. "Using Repeat Challengers to Estimate the Effect of Campaign Spending on Election
  Outcomes in the U.S. House." *Journal of Political Economy* 102, no. 4 (1994): 777-98.
  doi:10.1086/261954.

Mian, Atif, Amir Sufi, and Francesco Trebbi. "The Political Economy of the U.S. Mortgage Default Crisis."
    American Economic Review 100, no. 5 (2010): 1967-998. doi:10.1257/aer.100.5.1967.

Perez-Truglia, Ricardo, and Guillermo Cruces. Partisan Interactions: Evidence from a Field Experiment
    in the United States." *Journal of Political Economy* 125, no. 4 (2017): 1208-243. doi:10.1086/692711.

Posner, Eric A., and E. Glen Weyl. "Quadratic Voting and the Public Good: Introduction." *Public Choice*
    172, no. 1-2 (2017): 1-22. doi:10.1007/s11127-017-0404-5.

Posner, Eric A., and E. Glen Weyl. *Radical Markets: Uprooting Capitalism and Democracy for a Just
    Society*. Princeton: Princeton University Press, 2018.

Quarfoot, David, Douglas Von Kohorn, Kevin Slavin, Rory Sutherland, David Goldstein, and Ellen Konar.
    "Quadratic Voting in the Wild: Real People, Real Votes." *Public Choice* 172, no. 1-2 (2017): 283-303.
    doi:10.1007/s11127-017-0416-1.

Rakich, Nathaniel. "Election Update: How The Latest Fundraising Numbers Shifted Our House Forecasts."
    FiveThirtyEight. October 18, 2018. Accessed December 21, 2018. https://fivethirtyeight.com/features/
    election-update-how-the-latest-fundraising-numbers-shifted-our-house-forecasts/.

Rondeau, Daniel, and John A. List. "Matching and Challenge Gifts to Charity: Evidence From Laboratory
    and Natural Field Experiments." *Experimental Economics* 11, no. 3 (2008): 253-67.
    doi:10.1007/s10683-007-9190-0.

Tullock, Gordon. "The Purchase of Politicians." *Western Economic Journal* 10 (1972): 354-55.

"US Census Bureau 2010 ZIP Code Tabulation Area (ZCTA) Relationship Files Overview." Census
    Bureau QuickFacts. September 01, 2012. Accessed December 21, 2018. https://www.census.gov/geo/
    maps-data/data/zcta_rel_overview.html.

"Who Are the Koch Brothers?" BBC News. June 10, 2018. Accessed December 21, 2018.
    https://www.bbc.com/news/world-us-canada-44385053.

Appendix A: Sample Letters

The content of each letter depends on the first-dimension condition, drawn from the set (Placebo, Website-Self, Website-Neighbors, List-Neutral, List-Own), and the second-dimension condition, drawn from the set (Placebo, PAC, Radical).

As discussed in Section 4, we draw on the letters in Perez-Truglia and Cruces (2017), making modifications primarily for the second set of conditions. For any tables that contain contribution information, we select the neighbors to be included as described in that section and include the true contribution amounts and parties. We use example names and amounts below, but the actual choices will clearly differ for each letter.

The following subsections contain examples of the letters that would be sent according to the protocol described in sections 4.1- 4.3.

A1: Website-Self

Dear Name,

This letter is intended to provide information about political campaign contributions made by individuals. The table below contains campaign contributions made by three individuals in your neighborhood to [name of recent race] between [dates of study]:

Name	Amount	Party
Lastname, Name	$250	DEM
Z., Alice	$200	REP
Y., Bob	$500	DEM

Your household was randomly chosen and is the only one in your area to receive a letter of this type.

Your name, address, and the details of your contribution are freely available on the Federal Election Commission website:

www.fec.gov/finance/disclosure/norindsea.shtml

You can use this website to see the contributions of your neighbors, friends, family, or co-workers. Accessing the website is anonymous.

[Begin the text corresponding to the second-dimension condition here.]

A2: Website-Neighbors

Dear [Name],

This letter is intended to provide information about political campaign contributions made by individuals., The table below contains campaign contributions made by three individuals in your neighborhood to [name of recent race] between [dates of study]:

Name	Amount	Party
Lastname, Name	$250	DEM
Z., Alice	$200	REP
Y., Bob	$500	DEM

Your household and other households in your area were randomly chosen

to receive a letter of this type.

Your name, address, and the details of your contribution are freely available on the Federal Election Commission website:

www.fec.gov/finance/disclosure/norindsea.shtml

You can use this website to see the contributions of your neighbors, friends, family, or co-workers. Accessing the website is anonymous.

[Begin the text corresponding to the second-dimension condition here.]

A3: List-Neutral

Dear [Name],

This letter is intended to provide information about political campaign contributions made by individuals. Your household was randomly chosen to receive this information. The table below contains campaign contributions **made by ten individuals in your neighborhood to [name of recent race] between [dates of study]:**

Name	Amount	Party
Lastname, Name	$250	DEM
Z., Alice	$200	REP
Y., Bob	$500	REP
X., Cathy	$300	REP
W., Dan	$250	REP
V., Eliza	$600	REP
U., Fred	$400	DEM
T., Gene	$350	DEM
S., Hannah	$375	DEM
R., Iris	$700	DEM
Q., James	$1,100	DEM

[Begin the text corresponding to the second-dimension condition here.]

A4: List-Own

Dear [Name],

This letter is intended to provide information about political campaign contributions made by individuals. Your household was randomly chosen to receive this information. The table below contains campaign contributions **made by ten individuals in your neighborhood to [name of recent race] between [dates of study]:**

Name	Amount	Party
Lastname, Name	$250	DEM
Z., Alice	$200	REP
Y., Bob	$500	REP
X., Cathy	$300	DEM
W., Dan	$250	DEM
V., Eliza	$600	DEM
U., Fred	$400	DEM
T., Gene	$350	DEM
S., Hannah	$375	DEM
R., Iris	$700	DEM
Q., James	$1,100	DEM

[Begin the text corresponding to the second-dimension condition here.]

A5: PAC

According to the Federal Election Commission, the limits on campaign contributions for individuals are:

- **$33,900** per year to national party committees

- **$10,000** per year to state, district, and local party committees combined

- **$5,000** per year to any other political committees

- **$2,700** per candidate for a given election

Additionally, individuals may contribute **unlimited amounts** to independent-expenditure political committees not associated with a particular candidate, commonly called super PACs.

Researchers at Princeton University prepared this letter as part of a study of campaign contributions. We will not send any further letters to your household or to your neighbors. You can find more information about this project at our website:

[include URL for website created for the study]

Thank you for your participation.

A6: Radical

[Hypothetical variant only:] The information above describes actual campaign contributions. Now, imagine a system in which your contribution is matched by an outside fund using a particular mathematical method that works as follows: the matching fund takes the square root of each contribution, adds up those values, and then squares them. The amount given to each party will depend on the result of that formula for your district. The examples below help explain how this works in detail:

- Four people donate $100 to Republicans and one person donates $400 to Democrats. The formula computes the values $(4\sqrt{100})^2 = 1,600$ for Republicans and $(\sqrt{400})^2 = 400$ for Democrats. The matching fund provides $1,200 to Republicans and $0 to Democrats to round the total contributions up to the formula values.

- Two people donate $100 to Republicans and two people donate $100 to Democrats. The formula computes the values $(2\sqrt{100})^2 = 400$ for Republicans and $(2\sqrt{100})^2 = 400$ for Democrats. The matching fund provides $300 to Republicans and $300 to Democrats to round the total contributions up to the formula values.

- 5 people each donate $100 to Republicans and 20 people each donate $25 to Democrats. The formula computes the values $(5\sqrt{100})^2 = 2,500$ for Republicans and $(20\sqrt{25})^2 = 10,000$ for Democrats. The matching fund provides $2,000 to Republicans and $9,500 to Democrats to round the total contributions up to the formula values.

This formula means that many small contributions will be matched by more than a few large contributions. For more information about this matching system, see

[here we would include the URL of a subpage of the study website

that provides the explanation from Buterin et al. (2018)]

In the attached survey, [this survey is not included, but would resemble the one in Appendix A8] you will be asked how much you would donate if a matching system like this existed. Please answer carefully, taking into account both the amount you are willing to contribute right now and how that would change if this matching program were implemented.

[Actual matching variant only:] The information above describes previous campaign contributions. For this election cycle, any contribution you make will be matched by an outside fund using a particular mathematical method that works as follows: the matching fund takes the square root of each contribution, adds up those values, and then squares them. The amount given to each party will depend on the result of that formula for your district. If the difference between the formula and the contributions is $1,500 or less [value is subject to change depending on funding], the matching fund will round up from the contributions to the formula's result; if the formula gives more than $1,500, then the percentage of $1,500 given to each party will depend on the formula. The examples below help explain how this works in detail:

- Four people donate $100 to Republicans and one person donates $400 to Democrats. The formula computes the values $(4\sqrt{100})^2 = 1,600$ for Republicans and $(\sqrt{400})^2 = 400$ for Democrats. The difference between the formula results of $1,600 + 400 = 2,000$ and the donations of $400 + 400 = 800$ is $1,200, less than $1,500, so the matching fund provides $1,200 to Republicans and $0 to Democrats to round the total contributions up to the formula values.

- Two people donate $100 to Republicans and two people donate $100 to Democrats. The formula computes the values $(2\sqrt{100})^2 = 400$ for Republicans and $(2\sqrt{100})^2 = 400$ for Democrats. The difference between the formula results of $400 + 400 = 800$ and the donations of $200 + 200 = 400$ is $600, less than $1,500, so the matching fund provides $300 to Republicans and $300 to Democrats to round the total contributions up to the formula values.

- 5 people each donate $100 to Republicans and 20 people each donate $25 to Democrats. The formula computes the values $(5\sqrt{100})^2 = 2,500$ for Republicans and $(20\sqrt{25})^2 = 10,000$ for Democrats. The difference between the formula results of $2,500 + 10,000 = 12,500$ and the donations of $500 + 500 = 1,000$ is $11,500, greater than $1,500, so the matching fund provides 20%—$300—to Republicans and 80%—$1,200—to Democrats.

This formula means that many small contributions will be matched by more than a few large contributions. For more information about this matching system, see

[here we would include the URL of a subpage of the study website

that provides the explanation from Buterin et al. (2018)]

[All variants resume here:] Researchers at Princeton University prepared this letter as part of a study of campaign contributions. We will not send any further letters to your household or to your neighbors. You can find more information about this project at our website:

[include URL for website created for the study]

Thank you for your participation.

A7: Placebo

Dear [Name],

This letter is intended to provide information about political campaign contributions made by individuals. Your household was randomly chosen to receive this letter.

[If the first-dimension condition is not Placebo, omit the portion above and start with the following sentence:]

According to the Federal Election Commission (FEC), the limits on campaign contributions for individuals are:

- **$33,900** per year to national party committees

- **$10,000** per year to state, district, and local party committees combined

- **$5,000** per year to any other political committees

- **$2,700** per candidate for a given election

Researchers at Princeton University prepared this letter as part of a study of campaign contributions. We will not send any further letters to your household or to your neighbors. You can find more information about this project at our website:

[include URL for website created for the study]

Thank you for your participation.

A8: Survey

Dear [Name Lastname],

We are researchers from Princeton University carrying out a non-partisan study about campaign contributions. This study includes some brief information and survey questions about the rules and regulations for individual campaign contributions in the United States.

We need your help for this study. We ask that you take five minutes of your time to read the attached information and fill out the confidential survey. [Include return instructions depending on the exact format of the survey] Of course, participation is completely voluntary.

As a token of our appreciation, everyone participating in the study will be entered into a drawing to win [an appropriate monetary prize]. Your entry does not depend on your answers to the questions; everyone who fills out the survey will be entered, and winners will be randomly chosen.

On the other side of this page, you can find more information about our study and contact information in case you have any further questions. [This information is not included in this proposal, but would be prepared according to IRB protocols]

Sincerely,

[Names of all involved in the study]

[Below we continue with the survey questions that would be included. Options are listed below the questions]

This survey asks about *your knowledge and beliefs* about campaign contributions. Please answer truthfully; if you do not know an answer, give your best guess.

1. What is your gender?

   Male   Female   Other/Prefer not to say

2. What is your age?

   17 or younger   18-24   25-44   45-64   65 or older

3. To the nearest $1,000, what is the maximum contribution an individual can make to a *political campaign*? Please choose only ONE answer:

   $1,000 $3,000 [correct] $10,000   Unlimited

4. To the nearest $1,000, what is the maximum contribution an individual can make to *an independent-expenditure political committee, or "super PAC?"*? Please choose only ONE answer:

   $1,000 $10,000 $50,000   Unlimited [correct]

5. Do you think the identity of contributors to political campaigns is *private* and kept secret or *public* and easily obtainable? Please choose only ONE answer:

   Private   Public [correct]

6. Now we are going to describe a proposal for *changing how campaign contributions are made.* Imagine a system in which any contribution is matched by an outside fund using a particular mathematical method that works as follows: the matching fund takes the square root of each contribution, adds up those values, and then squares them. The amount given to each party will depend on the result of that formula for your district. The examples below help explain how this works in detail:

   - Four people donate $100 to Republicans and one person donates $400 to Democrats. The formula computes the values $(4\sqrt{100})^2 = 1,600$ for Republicans and $(\sqrt{400})^2 = 400$ for Democrats. The matching fund provides $1,200 to Republicans and $0 to Democrats to round the total contributions up to the formula values.

   - Two people donate $100 to Republicans and two people donate $100 to Democrats. The formula computes the values $(2\sqrt{100})^2 = 400$ for Republicans and $(2\sqrt{100})^2 = 400$ for Democrats. The matching fund provides $300 to Republicans and $300 to Democrats to round the total contributions up to the formula values.

- 5 people each donate $100 to Republicans and 20 people each donate $25 to Democrats. The formula computes the values $(5\sqrt{100})^2 = 2,500$ for Republicans and $(20\sqrt{25})^2 = 10,000$ for Democrats. The matching fund provides $2,000 to Republicans and $9,500 to Democrats to round the total contributions up to the formula values.

This formula means that many small contributions will be matched by more than a few large contributions. For more information about this matching system, see

[here we would include the URL of a subpage of the study website

that provides the explanation from Buterin et al. (2018)]

If your donation were matched in this way, how much would you contribute? Please answer carefully, taking into account both the amount you are willing to contribute right now and how that would change if this matching program were implemented. [free response]

7. Think about others in your neighborhood. If this matching program were implemented, how do you think *their contributions* would change? Choose only ONE option:

A *large majority* of your neighbors would contribute *more*

A *majority* of your neighbors would contribute *more*

A *majority* of your neighbors would contribute *about the same amount*

A *majority* of your neighbors would contribute *less*

A *large majority* of your neighbors would contribute *less*

8. This question asks about *your neighbors' knowledge and beliefs* about campaign contributions. Think about others in your neighborhood. Would you say that... (choose ONE option)

A *large majority* of your neighbors believe contributions to political campaigns are *private*

A *majority* of your neighbors believe contributions to political campaigns are *private*

A *majority* of your neighbors believe contributions to political campaigns are *public*

A *large majority* of your neighbors believe contributions to political campaigns are *public*

9. How much do you think an average person in your neighborhood *actually contributes* to political campaigns each election cycle? [free response]

10. How much do you think an average person in your neighborhood *should contribute* to political campaigns each election cycle? [free response]

11. Recall the matching system described in Question 6 above. *If that matching system were implemented,*

how much do you think an average person in your neighborhood *would actually contribute* to political campaigns each election cycle? [free response]

12. *If that matching system were implemented*, how much do you think an average person in your neighborhood *should contribute* to political campaigns each election cycle? [free response]