GETTING A SEAT AT THE (ELECTORAL) TABLE: PARTISAN POLL WORKERS AND ELECTORAL BIAS[*]

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October 2023

Word count: 9,990

Does poll workers' partisanship affect electoral outcomes? Many countries use partisan and adversarial vote-counting systems where poll workers are party representatives and mutual control is expected to provide fairness. Yet in countries with dominant party regimes, parties often have *de facto* unequal capacities to send representatives to all booths. Exploiting as-if random assignment of voters to booths in Paraguay's 2018 general elections, we estimate that partisan poll workers decrease an opposing party's vote share by up to 2 percentage points (pp) and increase theirs by up to 1 pp. Our analyses also demonstrate how incentives for electoral manipulation vary by electoral system. Dominant parties' poll workers collude against smaller parties more often in proportional representation races. In contrast, single-winner plurality voting yields less collusion because the winner-take-all aspect of these races hampers collusion. Our results have practical implications for politicians and policymakers, and theoretical implications for elections in developing democracies.

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"... it does not matter how many votes a candidate gets, but how many the poll workers record on the vote tallies."

– Carlos María Ljubetic, electoral justice adviser quoted in ABC Color (2018*a*)

"Indeed, you won the elections, but I won the count."

– Anastasio Somoza, Nicaraguan dictator quoted in Gott (1977)

1   Introduction

In developing democracies, ensuring the integrity of the vote count is an ongoing process. One approach adopted by several countries to ensure the quality of elections has been the use of adversarial controls. In these systems, *political parties* are given roles in polling stations, and through mutual controls between the competing parties, fair electoral results are expected to be registered on election day. Partisan poll watchers who observe the vote count process are found in countries throughout the globe, including Argentina (Casas, Díaz and Trindade 2017), Mexico (Ascencio and Rueda 2019), Turkey (Duvar 2021), and the United States (Brennan Center 2021). Countries where explicitly partisan representatives can be polling station administrators or poll workers (i.e., those counting votes) include Nicaragua, Honduras, Paraguay, Armenia, Yemen, Ukraine, Kosovo, El Salvador, Costa Rica, and Colombia (Pomares et al. 2015; Sjoberg 2016).

However, a potential vulnerability of adversarial control systems is that their fairness depends on the operational capacities of different political parties. In particular, larger parties with stronger operational capacities are more capable of ensuring that their votes are correctly counted and protected, while smaller parties are left more vulnerable to distortions if they cannot cover all voting booths. This paper explores whether unequal party capacities affect the fairness of adversarial, partisan vote-counting systems. That is, do adversarial vote control systems work in contexts with differing party capacities?

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Identifying the effect that political party capacity has on electoral outcomes has been difficult to measure for several reasons. First, democratic voting is often protected by the secret ballot. Although the secret ballot is useful in protecting voters from undue coercion (Baland and Robinson 2008), it also makes it more difficult to determine whether each vote counted represents a voter's stated preference, or whether some intermediate factor distorted voters' preferences during the counting process. Second, the operational capacity of a political party is not necessarily independent from the popularity of that party, which makes it difficult to discern what factor causes revealed favorable electoral results for a given party.

In this article we explore how party capacity affects the fairness of adversarial control systems by studying the 2018 Paraguayan General Elections. Paraguay provides a great testing ground for our theory of adversarial control systems for various reasons.

First, although Paraguay transitioned to democracy in 1989, the party of the former dictatorship, the National Republican Association (also known as the *Colorado* party), continues to have higher levels of resources and operational capacities than the second-largest party, the Authentic Radical Liberal Party (also known as the *Liberal* party), and all other smaller political parties. Therefore, Paraguay is an interesting case to explore how variation in parties' operational capacity affects elections.

Second, we assembled fine-grained election data on the explicit partisanship of poll workers, which allows us to test our theory in a rigorous manner. The lowest level of the Paraguayan electoral administration is the electoral table, which is equivalent to a voting booth. Through a combination of soliciting public records from the electoral administration, and hand-coding thousands of scans of election-day vote tallies, we assembled a painstakingly detailed database of all 21,211 electoral tables of this election. Importantly, on these tallies the poll workers signed and included their ID numbers, which we match to partisan affiliation data sets to uncover the partisan composition of poll workers at each electoral table. These data demonstrate that political parties have unequal poll worker representation across voting booths, as had been argued in previous electoral

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observation missions in Paraguay (EU 2013).

Third, within polling stations, which contain multiple voting booths, voters are assigned to booths alphabetically and we show that voters' names are orthogonal to their political preferences. Therefore, this as-if random assignment of voters to booths implies that on average, voters across voting booths within a given polling station should have similar political preferences. By exploiting this aspect of the data generating process we are able to credibly isolate how characteristics of electoral tables—namely the party identification of poll workers—affect electoral outcomes independent of the preferences of voters.

Finally, the 2018 Paraguayan elections are interesting because of the structure of the ballots used for all six elections held. These six elections are for President, the Senate, the Chamber of Deputies, Governor, Departmental Council, and MERCOSUR parliament. The president and governors are elected by single-member district plurality (SMDP) voting, while the remaining four races have a proportional representation (PR) system. For each electoral race a single ballot contains all available party options, and Paraguay uses separate ballots for each race.[1] This ballot structure allows us to explore how poll workers behave strategically in their attempts to protect or discard votes. Given that within each electoral table the *same* voters and the *same* poll workers are counting *different* races with *different* electoral rules, this gives us an unprecedented opportunity to explore how incentives for electoral fraud vary under different electoral systems. Specifically, we focus on how SMDP electoral systems compare to PR in creating incentives for poll workers to commit or prevent fraud.

Our results show that it is always beneficial for a political party to be represented at an electoral table–meaning that parties with higher operational capacity will systematically benefit. In terms of how electoral systems affect incentives to commit fraud, our results suggest that PR races provide

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[1] See Supplemental Information (SI) Figure A1 for an image of the ballot used for the senatorial election.

greater scope for collusion in electoral fraud among partisan poll workers of the two traditional parties vis-à-vis smaller parties. This is because annulling and redistributing smaller-party votes among themselves can aid both parties in earning seats for their legislative candidates. In contrast, SMDP voting yields less scope for collusion as these elections have only one winner, and partisan poll workers may attempt to take votes from all parties running against their own.

Our results demonstrate how electoral integrity can be incomplete for developing democracies in multiple ways. Our findings and others such as (Duarte et al. 2019; Finan and Schechter 2012), convey how traditionally dominant political parties seek to maintain their power despite advances in democratization. Across several countries, particularly those of Latin America, traditionally dominant parties have foundered in recent years as these countries have further democratized (Lupu 2016). Our findings point to some methods through which traditionally dominant, high-operational-capacity parties can tilt the playing field through alternative means, such as vote buying and ensuring their partisan poll workers count votes. Fraud in this account can reinforce the effects of electoral institutions that foment a two-party system by further advantaging dominant parties in PR elections.

In practical terms, our results suggest to parties in adversarial systems that ensuring their parties' poll worker representation is advisable. This has been commented on intuitively in Paraguayan political circles and the media before (ABC Color 2018*a*; Colmán Gutiérrez 2018; Ferrara 2016), yet our study provides the first empirical analysis that the composition of partisan poll workers counting votes significantly affects electoral outcomes. While our estimated electoral distortions generated by partisan poll workers may not determine many elections on their own (as we find no effects above 3 percentage points in absolute value), we argue in our discussion section that our empirical strategy probably provides conservative estimates of the true effect of partisan poll workers on electoral outcomes. Yet through this conservative strategy, we provide strong evidence of how a portion of electoral results does not depend on the preferences of voters and instead depends on the capacity of parties.

2 Literature Review

A broad literature analyzes election irregularities at different stages (Birch 2011; Lehoucq 2003; Simpser 2013). A closely related literature studies the role of partisan poll watchers who oversee the vote count and may indirectly influence electoral results (Ascencio and Rueda 2019; Casas, Díaz and Trindade 2017). These papers highlight how parties spend resources to have more poll watchers, how this advantages parties with greater organizational capacity, and how parties may allocate poll watchers to electoral tables strategically.

In contrast, our paper is about poll *workers*— those actually counting votes and thus more able to influence election results. A more recent literature has analyzed poll workers. For example, Challú, Seira and Simpser (2020) show that nonpartisan benign errors are made by Mexican poll workers with lower education and higher workload.

We contribute to this growing literature in three ways. We showcase a research design that allows one to identify if partisan poll workers affect electoral outcomes in a way that is independent from voters' preferences. Second, by obtaining data on both the pre-registered and election-day poll workers, we can quantify how parties' capacity vary between their aspirations and *de facto* capacity on election day. These analyses show how smaller parties may ambitiously pre-register more poll workers than they can actually turn out on election day, which eventually benefits the parties with greater capacity.

Finally, the ballot structure of Paraguayan elections gives us a unique opportunity to explore how fraud can vary depending on the electoral system. Because each electoral race uses an independent ballot, poll workers can decide whether to count votes honestly or fraudulently by election type. For example, poll workers can decide to commit fraud on the legislative elections, but choose not to do so on the executive elections. Our study leverages data from six different elections nationwide, which allows us to test new hypotheses compared to Ascencio and Rueda (2019) and Casas, Díaz and Trindade (2017).

https://doi.org/10.33774/apsa-2022-fd0gv-v5 **ORCID:** https://orcid.org/0000-0001-8541-5886 Content not peer-reviewed by APSA. **License:** All Rights Reserved

Historically, it has been difficult to explore how different electoral systems either promote or prevent fraud. In a cross-national study of 24 postcommunist countries, Birch (2007) finds that elections held under plurality rule are more likely to be the object of malpractice than those run under PR, as the author argues that candidates in SMD have more to gain from malfeasance and that the number of votes needed to change the outcome is often smaller. Yet the identification of the effect that electoral systems have on fraud is difficult to disentangle because we expect individuals to vote strategically. That is, even voters with stable and sincere preferences across different races behave quite differently depending on the number of candidates available. For example, in a single-member district election, citizens might decide to vote for one of the top two candidates available rather than voting for a third candidate they prefer, because voting for a third party would be a "wasted" vote. However, under a multi-member district election, voting for third parties should increase (Cox 1997). In exploring how incentives for electoral fraud vary from one electoral race to another, it would therefore be necessary to subtract the effect that strategic voting has on electoral behavior.

In Paraguay, this is possible because separate ballots are used for each electoral race. As we explain in further detail on Section 5, by leveraging electoral race and polling station fixed effects we can capture the effect of strategic voting within each polling station. Doing this essentially allows our regression models to absorb and subtract strategic voting from our estimated poll worker effects. Because voters within voting booths but across races are constant, absorbing strategic voting should allow us to equalize voter behavior across different races. Hence, the main variance between booths across races after taking our fixed effects into account should be a function of the behavior of poll workers instead of voters across different ballots. Thus, the ballot structure of Paraguayan elections allows for fraud to be committed independently at the electoral race level within each voting booth. This provides us with a unique opportunity to explore how incentives for electoral fraud vary under different electoral institutions—particularly SMDP and PR systems.

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3 Paraguayan Election Administration Institutions

In this section we briefly overview how electoral institutions work in Paraguay. The electoral system in Paraguay has a judicial arbiter intermediating between competing partisan actors at the national, departmental, district (municipalities), polling station, and electoral table (voting booth) levels. At the national level the judicial arbiter is the Supreme Tribunal of Electoral Justice (TSJE), which manages lower levels of the electoral court.

At the lowest level of the electoral administration structure are polling stations, which are usually schools, and within these polling stations are the electoral tables. At the table level all parties are entitled to send *veedores* (poll watchers).[2] However, the Electoral Code establishes **only the three largest parties**—in terms of their representation in the legislature—are each entitled to one poll worker seat in each electoral table.[3] As the Colorado and Liberal party have always had the most or second most seats in Congress, in practice this rule implies that these parties are *always* entitled to at least one seat in every electoral table. The third spot has been assigned to different parties throughout Paraguay's democratic period, but in the 2018 elections, this spot was reserved for the left-wing *Frente Guasu* (FG) party which had the third most seats in Congress at the time.[4]

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[2]Unlike the poll worker data we are able to collect, the election authority only collects data on the partisan poll watchers pre-registered in advance of the election and does not require poll watchers to sign and include their ID numbers on vote tallies on election day. Hence, we are not able to determine the *de facto* poll watchers at each voting booth. In results available upon request, we confirm the robustness of our main results after controlling for pre-registered poll watchers.

[3]The determination of electoral rules in the most recent Electoral Code of 1996 was largely dominated by the Colorado and Liberal parties, which at the time faced the most competition by another third party and the three-member electoral table rule has remained.

[4]Technically, the FG is an electoral alliance of smaller left-wing political parties which run

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Thus, all other political parties are excluded from having electoral table poll workers unless the top three parties do not pre-register for all the spots they are entitled to.[5]

Within each electoral table, the voting process proceeds as follows. Weeks before the election, one member of each electoral table is randomly selected to be the "president" of the table, while the two others remain as members called *vocal* 1 and *vocal* 2.[6] Despite this on-paper hierarchy, all three members are mostly equal in terms of attributions, and any conflicts are decided by a simple majority decision. At the end of the day, all three members count the votes together and each writes up a vote tally (called *acta electoral*) for each race of the table. All three members are required to sign each vote tally, acknowledging that they agree with the counted and registered results. Importantly, in 2018 the Electoral Code stipulated that after the elections take place the actual paper ballots are discarded, leaving the table-level tally as the lowest-level electoral document which can be inspected by parties and electoral administrators after the election day (Última Hora 2018).

Despite this formal structure created to protect votes, there are several ways in which this setup can be subverted to benefit certain political parties through informal institutions (Helmke and Levitsky 2004). For example, although the electoral code stipulates that each party with reserved seats should have at most one poll worker at each table, in practice this is not always followed as vacancies on the day of the election often occur. These vacancies are most often filled by

together under the FG name for elections. The FG member parties are PPS, PFA, PPC, PPT, PCP, PCPS, PMPP, and PUP.

[5]These limits on the number of poll workers at each booth are common throughout Latin America and vary between three to five (Pomares et al. 2015).

[6]See SI Figure A2 for a picture of a typical electoral table setup.

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the Colorado and Liberal parties through election-day replacements of poll workers.[7] Through our own conversations with political party activists and through focus groups done with political brokers by a local political scientist (Lachi 2009), we learned how poll worker representation is "fundamental" for parties and how some poll workers are bribed to skew results or not show up (Lachi 2009; Paraguay 2018).[8] Although these quotes may be hyperbole, they indicate a possible scope for malfeasance and that political parties care about having partisan poll workers present. In addition, political parties use their own funds to pay for transportation and meals for poll workers as this is not covered by the election authority (Lachi 2009), which favors better funded parties. Finally, political party activists revealed to us that some political parties encourage their voters to show up to their polling stations early, in case the pre-registered poll workers do not show up. Given that by law each electoral table has to have three members, if the pre-registered poll workers do not show up they can be replaced by any voter present in the polling station. We expect that this practice also tends to favor the traditionally dominant parties which have more registered voters.

Given that poll workers can be replaced from "fair allocations" (where no party has more than one poll worker) to "unfair" allocations where some party or coalition has a majority, our first two

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[7] If a pre-registered poll worker does not appear, they can be substituted by a pre-registered substitute poll worker if a party has one available in the polling station. If there are no pre-registered substitute poll workers at the polling station when a vacancy occurs, then any voter at the polling station can become a poll worker if they are available to work as a table member for the remainder of the day. Often some partisan poll watchers become poll workers if the substitute poll workers also do not appear. Anecdotally, the empowered party officers present at a polling station will discuss and negotiate the possibility of seating their party affiliates at tables within a polling station.

[8] The news article from Paraguay (2018) is linked to a video where journalists interview an anonymous political broker who claims that electoral tables can be "bought" by bribing poll workers to distort the electoral results.

hypotheses concern the partisan allocations of electoral tables:

> **Hypothesis 1:** A party that has a majority of poll workers in an electoral table (that is, either two or three out of three) will have higher vote shares.

> **Hypothesis 2:** Parties lacking poll workers at an electoral table will tend to receive a lower vote share.

In terms of actual poll worker behavior, what is anecdotally said to occur is that Colorado and Liberal poll workers defend their votes, and may distribute among themselves the votes for remaining parties that do not have a representative at the voting booth (ABC Color 2018*a*; Lachi 2009).[9] Allegations like this also emerged after the 2018 elections. A Paraguayan columnist remarked that his vote for a small party representing indigenous peoples was stolen (Colmán Gutiérrez 2018) since he observed *zero* votes for his party on the electoral table result published by the election authority. A similar allegation was made by another voter who voted for another small party (ABC Color 2018*b*). Further reports can be found in the SI. Results at the voting booth level can only be challenged during the counting process among poll workers, poll watchers, and party officers that are present, which limits the ability of smaller parties to protect their votes.

Finally, as mentioned above, the fact that Paraguay uses separate ballots for different races means that poll workers have the ability to perform fraud at races selectively. Given that PR races tend to field more candidates and that multiple parties earn seats, the incentives for collusive fraud are higher for dominant parties' poll workers in PR races than in SMDP races. In other words, dominant parties' poll workers will have fewer incentives to collude and re-distribute small-party votes among themselves under SMDP elections than under PR elections because of the winner-

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[9]See SI Figure B4 for a newspaper infographic from ABC Color (2018*a*) alluding to how colluding coalitions of poll workers could alter the count.

take-all nature of SMDP elections. Therefore, the fewer candidates present and the zero-sum nature of SMDP races provide fewer incentives for collusive fraud. Therefore:

> **Hypothesis 3:** In proportional representation electoral races there should be more collusive fraud between the dominant parties' partisan poll workers present. That is, they should be more prone to redistribute the votes of absent parties among themselves as it would be mutually beneficial.

4 Data

We assembled a highly disaggregated database for the 2018 Paraguayan general election. These elections had around 1,100 polling stations with approximately 21,000 electoral tables nested within them. The median and mean number of tables within a polling station are 16 and 19 respectively. Again, within each electoral table, paper ballots are given for each of six individual races and thus six table-level vote tallies exist.[10] To explore our research questions we rely on three kinds of data: (1) the electoral results, (2) data on the characteristics of voters, and (3) data on the characteristics of electoral tables—including the partisan support of the poll workers.

The most straightforward data we obtained were the electoral results. The TSJE published the electoral results at the voting-booth level online for this election. Thus, to access these data we simply downloaded it from TSJE data repositories online.

Second, we obtained data on the characteristics of voters from a variety of sources. First, we relied on the 2018 electoral registry from the TSJE. This dataset gives us information about all registered voters in the country, including their national identification number, and information

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[10]One exception is the capital Asunción because it is a federal district, so governors and departmental legislators are not elected there. Also, Paraguayan voters abroad could only vote for president, senators, and the MERCOSUR parliament.

about which polling station and electoral table each voter was assigned to by the TSJE. In addition, because the TSJE assists political parties with organizing their party primaries, it collects data on the partisan affiliation of each registered voter from political parties. We match the 2018 electoral registry to the partisan support data through voters' ID numbers, which allows us to identify the proportion of partisan support for each party at each electoral table in the 2018 general election.

Finally, we obtained data on the partisanship of poll workers from two different sources. First, before each election, political parties pre-register their partisan poll workers with the TSJE. These data from the TSJE gives us the "planned" allocation of poll workers to electoral tables and the party they support. However, one limitation of these data is that on election day only some of the pre-registered poll workers make it to their electoral tables, thus some electoral tables experience election-day absences. Simply looking at the pre-registered allocation of poll workers to tables is insufficient, because we need to observe the *de facto* allocation of poll workers to electoral tables—that is, those that actually showed up on election day.

To acquire information on the *de facto* allocation of poll workers to electoral tables we scraped the TSJE's website for scans of quick count vote tallies of each electoral table for each electoral race. This gave us around 120,000 quick count vote tallies for all electoral tables.[11] Interestingly, these vote tallies required poll workers to sign them and write their national ID numbers at the bottom of the tallies.[12] We then digitized the national ID numbers written by poll workers on their

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[11]SI Figure C1 shows all the quick count tallies from one electoral table.

[12]Although it is possible that some poll workers could have forged the signature and ID number of pre-registered poll workers we find this unlikely for several reasons. First, as is shown in the paper, more than a third (more than 21,000) of all pre-registered poll workers get replaced according to our data, showing that a substantial number of replacement poll workers are willing to acknowledge they are not the pre-registered poll workers. Second, it was not expected that the quick count vote tallies would be made available to the wider public, because these elections were the first

vote tallies, and checked whether these corresponded to the pre-registered poll workers or whether a poll worker was replaced by merging our datasets at the national ID level. To obtain the partisan support of replacement poll workers we merge in the partisan support datasets mentioned above.

To summarize our main results from these comparisons, in Figure 1 we find that most electoral tables had one or more poll workers replaced, as we graph the frequency of tables that had a certain number of poll workers replaced. In fact, more than 21,000 poll workers (more than a third of the pre-registered poll workers) were replaced. In Figure 2 we show how these replacements favored some parties at the expense of other parties, as we show the proportion of electoral tables with a certain number of Colorado, Liberal, and FG poll workers. The histograms in gray show how the pre-registered allocation of poll workers is relatively balanced as the main parties have only one poll worker per electoral table at most electoral tables. In contrast, the election-day *de facto* allocation of poll workers outlined with dashed lines is more skewed towards the two main parties (Colorado and Liberal), particularly the Colorado party. Instead, the FG loses a substantial portion of their poll workers on election day. Further details on the data construction, descriptive statistics, and comparisons between the pre-registered and *de facto* poll workers are contained in the SI Section C.

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ones where this occurred. Third, working as a poll worker or political broker are anecdotally tasks that many ambitious members of the traditional political parties (Colorado and Liberal) perform to climb up the political ladder of these parties. Recording their names and ID numbers honestly allows party officials to know who supported the party as poll workers during the elections.

Figure 1: Total poll workers replaced at each voting booth
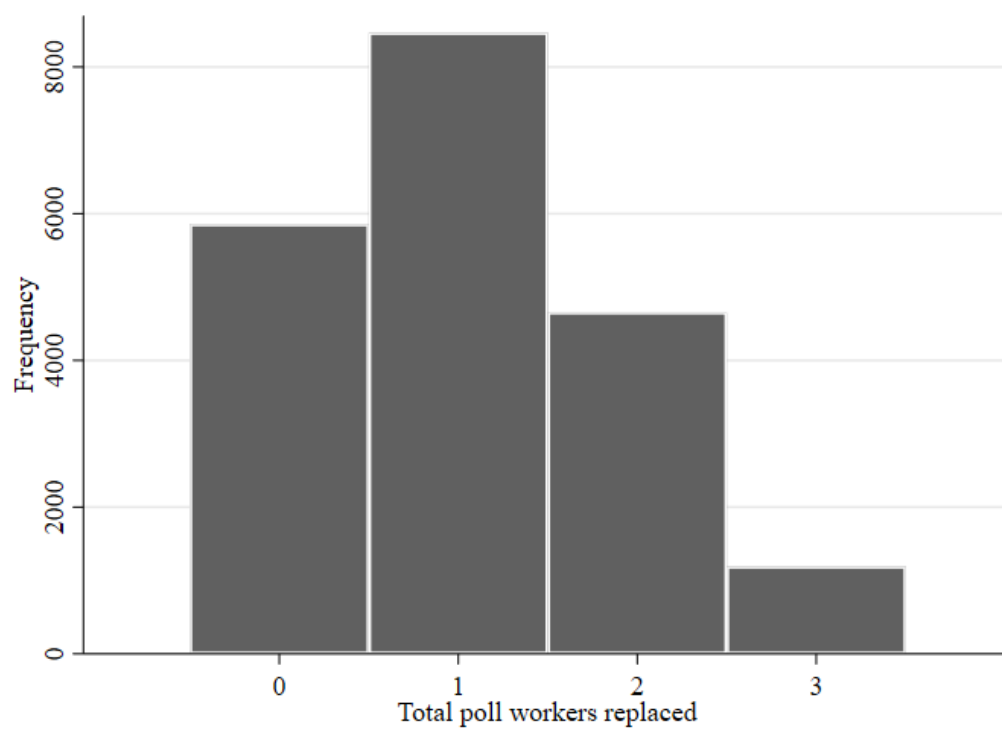
Figure 2: Pre-registered and *de facto* allocation of partisan poll workers
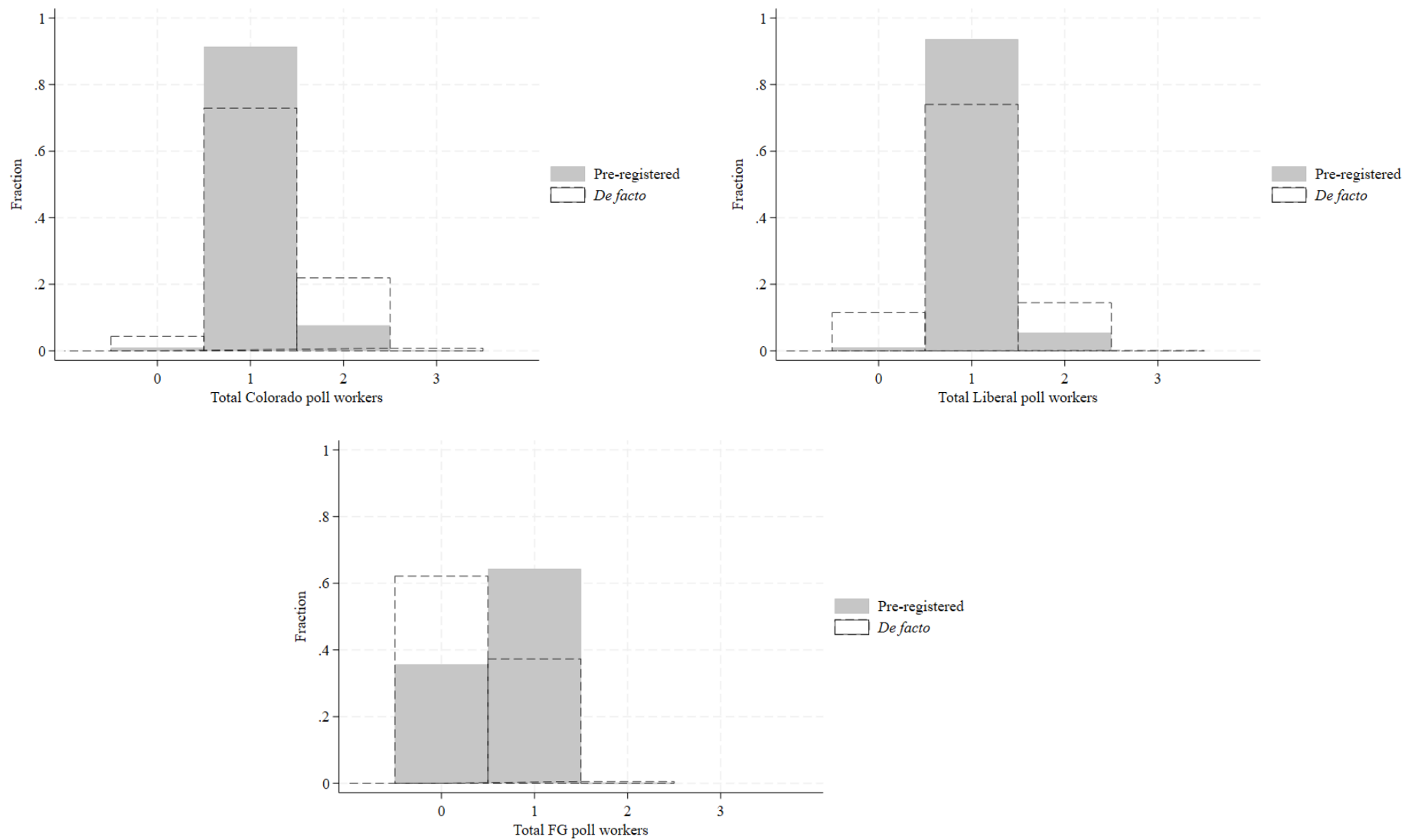
5 Empirical Strategy

The difficulty with disentangling the effect of partisan poll workers on electoral results is the secret ballot. Although it is quite beneficial as it allows voters to express themselves honestly at the polls (Baland and Robinson 2008), the secret ballot makes it difficult to identify fraud because we cannot observe whether the final votes were changed at a booth or not, as we can never see the original individual votes. Sometimes there are suspicious results, particularly when the electoral results come from a booth counted by a single party. Yet it is difficult to know without further evidence if those electoral results are fraudulent or if they truly represent the preferences of voters from that booth.

Having established these limitations, what is interesting about the Paraguayan case is the as-if random allocation of voters to voting booths. In Paraguay, citizens vote at polling stations which tend to be close to their homes and are usually schools. Within polling stations, voters are assigned to voting booths alphabetically—according to the first letters of their surnames. Voters are ordered alphabetically among those from their polling station and every group of 200 voters gets their own voting booth. Thus, the first 200 voters get assigned to voting booth number 1, the next 200 voters get assigned to voting booth number 2, and so on until all voters are assigned to a voting booth.[13] Similarly to Casas, Díaz and Trindade (2017), we test whether the first letters of surnames are uncorrelated with political preferences and electoral results. If so, we have an as-if random assignment of voters to electoral tables which allows us to credibly assume that similar electoral outcomes should be recorded across tables within the same polling station. Hence, any strong deviance in electoral results within polling stations suggests that differences across tables are due to qualities of the tables themselves (particularly the partisan poll workers) and not the

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[13]Given that most polling stations do not have an exact multiple of 200 voters, the last voting booth in each polling station most often does not have exactly 200 voters.

preferences of voters.

We run tests to confirm whether the alphabetical assignment of voters to voting booths within polling stations can be considered as-if random. We do this by testing directly for the association between voters' partisan support and their surname initials. To our knowledge, this is the strongest and most direct test of this identification strategy thus far in the literature. Other papers that rely on this identification strategy have used proxies for the political preferences of voters instead of their partisan affiliation and support according to the election authority. Cantú (2014) tests whether voters' surname initials correlate with TV viewership or being an *Oportunidades* (conditional cash transfer) recipient. Casas, Díaz and Trindade (2017) test whether surname initials correlate with congressional candidates' parties and whether surname initials correlate with employee wages from a specific municipality. Our test with voters' actual political preferences and surname initials is more direct. Our analyses, which confirm that voters' political preferences are uncorrelated with their names, can be found in SI Section D.

The results from our test provides a rationale for our assumption that the assignment of voters to voting booths is an as-if random assignment. Thus, any strong deviance in results recorded across booths within a polling station are likely due to the partisan representation of poll workers in booths after we control for polling station fixed effects. Then by focusing on differing allocations of partisan poll workers in booths and using polling station fixed effects, we explore variation *within* polling stations *between* booths. There is a large literature on the determinants of election fraud that highlights variables such as socioeconomic inequality (Ziblatt 2009), political competitiveness (Lehoucq 2003), community social networks (Duarte et al. 2019), among others. This design controls for these variables and others such as local state capacity, partisan control of the municipal or state government, urban vs. rural districts, among others. That being said, one caveat from our empirical strategy is that we do not capture variation in electoral malfeasance across polling stations, given that we net these out with the polling station fixed effects. Still, finding any significant deviance in results across booths within stations should be indicative of the wider effect

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of partisan poll workers.

To operationalize the allocation of partisan poll workers, we developed several different indicator categories. When all three poll workers at an electoral table support the same party, we have what we call a "trifecta." In our most common regression specifications, we then include dummy variables for Colorado and Liberal party trifectas separately. We also generate additional variables for when two out of the three poll workers at an electoral table support the same party, which we refer to as an "advantage." For the "advantage" indicator variables we separate these into four types: "Colorado advantage + Liberal," "Colorado advantage + Other," "Liberal advantage + Colorado," and "Liberal advantage + Other." For these variables, "other" refers to a poll worker that is not registered as supporting either the Colorado or Liberal party. Our excluded category corresponds to voting booths with "fair allocations" having only one Colorado poll worker and one Liberal poll worker. Finally, we have an indicator variable for "other poll worker allocations", which refer to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced above. For example, a voting booth with two FG poll workers or a voting booth with two poll workers not registered as supporting any party would correspond to this "other poll worker allocation" category. Given the way these indicator variables are defined, they are all mutually exclusive and together cover all voting booths in our data.

If we treated our data as resulting from a natural experiment, we would include polling station-level fixed effects and model several sets of dependent variables of interest, such as vote shares at the booth level for (1) the Colorado party, (2) the Liberal party or GANAR Alliance,[14] and (3) all

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[14]For the presidential race, the Liberal party and several smaller parties banded together to present a single candidate under the GANAR alliance. The full list of parties that were part of GANAR are: Liberal party, PRF, PDP, PEN, AP, PMAS, and the FG member parties. This alliance also existed for a few other races for deputy, governor, and departmental council. Yet in practice, the Liberal party mainly ran its own candidates through it, and the FG often fielded separate

other parties. Hence, we would run regression specifications with the following format:

$$Y_{ab} = \beta_0 + \beta_1 Colorado\_Trif_{ab} + \beta_2 Colorado\_Adv\_Oth_{ab} + \beta_3 Colorado\_Adv\_Liberal_{ab}$$

$$+ \beta_4 Liberal\_Adv\_Colorado_{ab} + \beta_5 Liberal\_Adv\_Oth_{ab} + \beta_6 Liberal\_Trif_{ab} + \beta_7 Other\_pw\_alloc_{ab}$$

$$+ \theta_a + \varepsilon_{ab},$$

where Y is some electoral outcome for voting booth b belonging to polling station a, and θ is a polling station fixed effect. Our coefficients of interest are the β's which capture the potential effect of different partisan poll worker allocations on electoral results.

Still, we address two potential selection issues. First, given that political party leaders are aware that poll workers matter for electoral results, prior to the elections they may prioritize pre-registering their poll workers at certain electoral tables over others. Although to our knowledge this sort of prioritization tends to happen at the polling station level instead of the booth level (and would thus be absorbed by the polling station fixed effects), we acknowledge this could occur at certain tables. Second, because political parties have different operational capacities and party membership at certain localities, locally high-operational capacity parties are more capable of filling vacancies. Although we again control for polling station-level differences, there could still be differences at the booth level in terms of who's registered to vote there.[15] Thus, we also explore how these partisan selection issues take place and how we address these.

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candidates for these other races too.

[15]If we compare the voting booth where the *de facto* poll workers worked with the booth where they would have voted if they were regular voters, we find that only around 3% of them worked at the booth where they would've voted if they were regular voters. This figure is quite small, which allays concerns that the observed effects from partisan poll workers derives from the partisanship of voters at the booth.

5.1 Exploring Selection

Political parties can use several strategies to assign poll workers to polling stations and voting booths to skew electoral outcomes in their favor. Yet through the use of polling station-level fixed effects, the remaining selection problems we must deal with relate to within-station selection strategies that political parties may pursue. We posit that there are two main selection strategies, and we will call them *central strategies* and *capacity-based network strategies*. Neither of these are necessarily "better" or "worse" in terms of electoral fairness, but they do present potential threats to our identification strategy, and exploring these threats interestingly allow us to describe the different "styles" of operational capacity that traditional parties can (or cannot) deploy.

Central strategies deal with the role that centralized party organizations play months before the elections take place. They can use information that they have at hand about their electorate to strategically pre-register their copartisans at electoral tables. One key piece of information that we expect party organizations to have is the proportion of voters affiliated to their parties assigned to each electoral table. With this information parties may: (1) place copartisan poll workers in tables with higher proportions of *their own* voters to protect the votes for their own party, or (2) place copartisan poll workers in tables with higher proportions of *opposing party affiliates* to dampen the votes of the opposition. The key idea here is that these party strategies are centralized and premeditated actions taken to protect (or undermine) votes. Because this behavior may be systematic, it can create selection problems that undermine our identification strategy if not controlled for.

Next, *capacity-based network strategies* allow certain parties to achieve a copartisan replacement of poll workers at tables where parties have more affiliated copartisans. This selection issue may be systematically related to outcomes recorded at electoral tables because: (1) electoral tables with more copartisans are more likely to have favorable outcomes for that party, and (2) a party's ability to place copartisan poll workers after a vacancy should be more likely with higher levels of

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registered copartisan affiliates. Hence, this mechanism results from copartisan networks acting in a decentralized manner.

To explore these two selection mechanisms we run three different regression models on Table 1. For both strategies we expect that the probability of a political party assigning a poll worker to an electoral table to correlate with the proportion of party affiliates at said table. Therefore, our three dependent variables are the proportion of: (1) Colorado party affiliates at a given table, (2) Liberal party affiliates at a given table, and (3) affiliates to any other political party at a given table. We include two groups of independent variables: (1) the centrally-planned *pre-registered* partisan allocation of poll workers to tables, and (2) the decentralized *de facto* partisan allocation of poll workers to tables. These groups of independent variables get at our two selection mechanisms mentioned above, and the partisan allocations of poll workers are operationalized using the indicator variable combinations of partisan poll workers previously discussed.

Table 1: Exploring party allocation strategies according to the proportion of affiliated voters

	% of Colorado voters (1)	% of Liberal voters (2)	% of other party voters (3)
Prereg. Colorado trifecta	1.5656 (1.9736)	-0.8783 (1.2282)	-1.3278** (0.6598)
Prereg. Colorado advantage + Other	-2.4710* (1.2812)	-0.3698 (1.0738)	-0.1382 (0.4615)
Prereg. Colorado advantage + Liberal	0.0903 (0.2092)	-0.1924 (0.1768)	0.0870 (0.0638)
Prereg. Liberal advantage + Colorado	0.0156 (0.2296)	0.1055 (0.2105)	0.0388 (0.0703)
Prereg. Liberal advantage + Other	-5.9477** (3.0004)	4.2494 (6.0294)	0.2792 (0.2751)
Prereg. other poll worker allocation	-5.8645** (2.6991)	3.4061 (2.5910)	-0.3407 (0.4298)
De facto Colorado trifecta	0.3145 (0.4248)	-0.0798 (0.3145)	-0.0640 (0.1851)
De facto Colorado advantage + Other	0.0704 (0.2201)	-0.1808 (0.1773)	0.0263 (0.1009)
De facto Colorado advantage + Liberal	0.0852 (0.1605)	-0.0987 (0.1334)	-0.0356 (0.0595)
De facto Liberal advantage + Colorado	-0.0340 (0.1718)	0.0701 (0.1505)	-0.0230 (0.0658)
De facto Liberal advantage + Other	-0.1820 (0.3648)	0.6906** (0.3390)	-0.0661 (0.1299)
De facto Liberal trifecta	2.1087 (1.4418)	0.0757 (1.2114)	-0.4266 (0.4629)
De facto fair allocation	0.1349 (0.1352)	-0.1771 (0.1116)	-0.0144 (0.0523)
Mean of Dependent Variable	34.1749	17.3445	17.3445
Polling station FE	X	X	X
Observations	20,354	20,354	20,354
R^2	0.7523	0.7930	0.4503

Note: A unit of observation is a voting booth. Standard errors are robust. The regressors correspond to either pre-registered or election-day (*de facto*) partisan poll worker allocations. A trifecta indicates all three poll workers from the same party work at the voting booth. There is no pre-registered Liberal trifecta in our data so we do not include it as a regressor. Advantage indicates that two out three poll workers from the same party work at the voting booth. Other refers to a poll worker that is not registered as supporting the Colorado or Liberal party. The excluded category corresponds to voting booths with a pre-registered "fair allocation" having one Colorado poll worker and one Liberal poll worker. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables. The *de facto* "other poll worker allocation" variable is collinear with the remaining regressors and is thus omitted from the output.

The main take-away from Table 1 is that the aforementioned strategies seem to be executed, even after controlling for polling station fixed effects. This implies that political parties may strategize at the table level in their attempts to fill poll worker positions in a way that correlates with the proportion of partisans that they have registered to vote at each table. The Colorado party, Paraguay's largest party and the party of the 1954-1989 dictatorship, seems to take a more centralized approach with the pre-registered poll workers. The Colorado party appears less concerned with gaining a majority of poll workers where it has fewer Colorado supporters, given the negative correlation between the proportion of Colorado voters at tables and the pre-registered allocations with two Liberal poll workers and one poll worker from another party, as well as the residual "other" poll worker allocation. In contrast, the Liberal party's behavior seems related to election-day replacements (through the *capacity-based network* mechanism). The Liberal party is less well-resourced than the Colorado party and is likely relying more explicitly on its local networks of supporters to volunteer as poll workers on election day if any poll worker is absent from their voting booth. Table 1 shows that a *de facto* allocation with two Liberal poll workers and a poll worker from another party is more likely at tables with more Liberal voters. Finally, the third regression on Table 1 shows that a pre-registered Colorado party trifecta is less likely at tables with a high proportion of voters supporting other political parties (i.e., neither the Colorado nor Liberal party).[16]

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[16]As will be seen in subsequent regression tables, the coefficients for trifectas are usually not significant. This may be occurring because at these tables it is likely that most voters support the party with a trifecta, and hence having poll workers is essential to guarantee that their votes are actually counted, but presumably adding more votes is more difficult as they are already close to the maximum number of votes. Hence, when we add control variables for the proportions of voters from the Colorado, Liberal, and other parties registered to vote at each voting booth we should not expect significant coefficients. There also are not many trifecta observations either, so

In short, political parties in Paraguay appear strategic in terms of how they allocate poll workers to electoral tables, even after controlling for polling station-level fixed effects. These selection issues are important to take into account when we focus on the effects that poll workers have on electoral outcomes in Section 6. We thus control for the proportion of voters supporting the Colorado, Liberal, and other political parties at the electoral tables to control for the possibility of strategic allocations by parties. This allows us to further isolate how the partisan allocation of poll workers affects electoral outcomes independent of the preferences of voters and political parties' allocation strategies. In addition, given that in Section 6 we emphasize analyses pooling all electoral races together, we add fixed effects for every combination of polling station and electoral race.[17] This allows us to only compare across voting booths from the same polling station and electoral race. This way we can account for differences between electoral races within each particular polling station—differences such as candidate characteristics and party options. Thus, our main regression specification has the following format:

$$
\begin{aligned}
Y_{abc} = &\beta_0 + \beta_1 Colorado\_Trif_{ab} + \beta_2 Colorado\_Adv\_Oth_{ab} + \beta_3 Colorado\_Adv\_Liberal_{ab} \\
&+ \beta_4 Liberal\_Adv\_Colorado_{ab} + \beta_5 Liberal\_Adv\_Oth_{ab} + \beta_6 Liberal\_Trif_{ab} + \beta_7 Other\_pw\_alloc_{ab} \\
&+ \delta_1 voter\_prop\_Colorado_{ab} + \delta_2 voter\_prop\_Liberal_{ab} + \delta_3 voter\_prop\_Other_{ab} + \eta_{ac} + \varepsilon_{abc}.
\end{aligned}
$$

$$(1)$$

where Y is some electoral outcome for electoral race c at voting booth b belonging to polling station a, and η is a fixed effect for each combination of electoral race and polling station. Our coefficients of interest here are still the β's which capture the potential effect of different partisan poll worker allocations on electoral results, after further controlling for voters' preferences and

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the statistical power is low.

[17]SI Section E shows how our results hold for each electoral race separately.

political parties' allocation strategies.[18]

In addition, we test for the possibility of differential incentives for electoral manipulation by electoral system. To do so, we generate an indicator variable for electoral races with a proportional representation (PR) system (i.e., the senatorial, MERCOSUR parliament, deputies', and departmental council races). In regressions including observations from all electoral races, we interact the PR race indicator variable with each of the indicator variables for different allocations of partisan poll workers.[19] Our regression specification for this test is as follows:

$$
\begin{aligned}
Y_{acb} = & \beta_0 + \alpha_1 Colorado\_Trif_{ab} \times PR_c + \alpha_2 Colorado\_Adv\_Oth_{ab} \times PR_c + \alpha_3 Colorado\_Adv\_Liberal_{ab} \times PR_c \\
& + \alpha_4 Liberal\_Adv\_Colorado_{ab} \times PR_c + \alpha_5 Liberal\_Adv\_Oth_{ab} \times PR_c + \alpha_6 Liberal\_Trif_{ab} \times PR_c \\
& + \alpha_7 Other\_pw\_alloc_{ab} \times PR_c \\
& + \beta_1 Colorado\_Trif_{ab} + \beta_2 Colorado\_Adv\_Oth_{ab} + \beta_3 Colorado\_Adv\_Liberal_{ab} \\
& + \beta_4 Liberal\_Adv\_Colorado_{ab} + \beta_5 Liberal\_Adv\_Oth_{ab} + \beta_6 Liberal\_Trif_{ab} + \beta_7 Other\_pw\_alloc_{ab} \\
& + \delta_1 voter\_prop\_Colorado_{ab} + \delta_2 voter\_prop\_Liberal_{ab} + \delta_3 voter\_prop\_Other_{ab} + \eta_{ac} + \varepsilon_{abc},
\end{aligned}
$$

$$(2)$$

where Y is some electoral outcome for electoral race c at voting booth b belonging to polling station a, and η is a fixed effect for each combination of electoral race and polling station. The coefficient

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[18]Throughout our analyses we use robust standard errors, yet in results available upon request we experimented with clustering the standard errors at the municipality level as well. The results are generally robust and qualitatively similar throughout with our earlier result with robust standard errors.

[19]In results available upon request, we also interact the PR race indicator variable with the proportions of voters from the Colorado, Liberal, and other parties registered to vote at each voting booth (Beiser-McGrath and Beiser-McGrath 2020) and the results are qualitatively similar.

for PR race is omitted because it is collinear once we control for polling station-electoral race fixed effects. Our coefficients of interest are the α's which capture the differential effect of partisan poll worker allocations on electoral results from PR races.

In SI Section E we present additional regression specifications and robustness checks that we performed on our main findings and additional regression specifications. Having presented our main regression specifications and addressed the main selection issues we might encounter, we now turn to how the partisan allocation of poll workers affects electoral outcomes independent of voter preferences.

6 Main Results

We now turn to our main dependent variables of interest, which are the vote shares each political party receives. We explore whether the allocation of partisan poll workers affects registered electoral results *independent of voters' preferences*. Overall, our results show a small but consistently significant effect of partisan poll workers on electoral outcomes independent of the preferences of voters. In other words, having more Colorado poll workers is advantageous to the Colorado party and detrimental to the Liberal party, and having more Liberal poll workers is advantageous to the Liberal party and detrimental to the Colorado party.

To test hypotheses (1) and (2) from Section 3, Table 2 examines the effect of poll workers on parties' vote share by pooling together observations from all elections and running equation (1). The dependent variables are the vote shares for the Colorado party, the Liberal party or GANAR alliance (which primarily ran Liberal party candidates), and other parties. In Column (1) we can observe that the Colorado party vote share increases significantly by around 0.43 and 0.51 pp, when the Colorado party has two poll workers counting votes. We also observe that if only the Liberal party is counting votes through a trifecta, the Colorado party vote share decreases significantly by 1.95 pp. Yet we take these trifecta results with a grain of salt because only 17 electoral tables have

a Liberal trifecta, whereas the Colorado party has a trifecta at 157 electoral tables.

In Column (2) we can notice that the Liberal/GANAR vote share increases significantly by around 0.21 pp when there are two Liberal poll workers and a poll worker registered to the Colorado party counting votes. We can also notice how the Liberal/GANAR vote share decreases significantly whenever the Colorado party has two or three poll workers counting votes. This result is robust to controlling for the proportion of partisan voters at each voting booth and it is interesting how this result varies symmetrically depending on which party has a poll worker majority at the electoral table. In particular, the average decrease in the Liberal/GANAR vote share is 0.38 when there are two Colorado party poll workers and one Liberal poll worker, around 0.5 when there is a Colorado poll worker and a poll worker not registered to the Colorado or Liberal party, and 0.51 if only the Colorado party is counting votes with a trifecta. We can also notice that "other poll worker allocations" lead to a significant decrease of approximately 0.16 pp. This is plausible because these other poll worker allocations (which occur at 2,563 electoral tables in total, around 12% of our sample of tables) include poll worker allocations where other parties have a majority of poll workers.

In Column (3) we can observe that if other parties lack representation at an electoral table and only the Colorado and Liberal party are counting votes, then other parties experience a significant decrease in their vote share. In particular, they experience a decrease of around 0.13 pp and 0.17 pp if either the Colorado or Liberal party have two poll workers and the remaining party poll worker also belongs to the Liberal party or Colorado party. We also observe a positive and significant increase in other parties' vote share whenever the Liberal party has a trifecta counting votes. In SI Section E we show that this result appears to be driven by the effect of Liberal trifectas on the departmental council elections. This result may be due to the Liberal party supporting other parties in the vote count, because often the Liberal party and other parties find themselves in the opposition to the Colorado party, yet it might also be idiosyncratic because there are only 17 electoral tables with Liberal trifectas. Lastly, we find that other poll worker allocations lead to a

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significant increase of approximately 0.13 pp in other parties' vote share. This is again plausible because other poll worker allocations include the cases where other parties have a majority of poll workers counting votes. In short, having a poll worker majority tends to be beneficial for parties' vote share while lacking a majority or having no representation tends to reduce parties' vote share, as posited in Hypotheses (1) and (2). In SI Section E we show how this conclusion also holds for each electoral race separately.

Table 2: Effect of partisan poll worker composition on election results

	Colorado vote share (1)	Liberal/GANAR vote share (2)	Other party vote share (3)
Colorado trifecta	0.2820	-0.5121***	0.2301
	(0.2029)	(0.1847)	(0.1752)
Colorado advantage + Other	0.4318***	-0.4969***	0.0651
	(0.0954)	(0.0790)	(0.0820)
Colorado advantage + Liberal	0.5125***	-0.3800***	-0.1325***
	(0.0493)	(0.0455)	(0.0433)
Liberal advantage + Colorado	-0.0328	0.2063***	-0.1735***
	(0.0525)	(0.0505)	(0.0483)
Liberal advantage + Other	-0.2126	-0.0035	0.2161
	(0.1611)	(0.1406)	(0.1442)
Liberal trifecta	-1.9481***	0.4756	1.4724***
	(0.5951)	(0.5947)	(0.4649)
Other poll worker allocation	0.0246	-0.1593***	0.1347**
	(0.0646)	(0.0597)	(0.0578)
Mean of Dependent Variable	41.5808	34.4445	23.9746
Polling station-elect. race FE	X	X	X
Colorado voter prop. control	X	X	X
Liberal voter prop. control	X	X	X
Other party voter prop. control	X	X	X
Observations	117,229	117,229	117,229
R^2	0.8425	0.8869	0.9308

Note: A unit of observation is a voting booth-electoral race combination. Standard errors are robust. The Liberal party always ran separately or through the GANAR alliance (while mainly proposing its own candidates), hence we have an outcome variable for Liberal/GANAR vote shares. Vote shares are calculated by dividing by the number of valid votes (i.e., all votes excluding null and blank votes) and multiplying by a 100. A trifecta indicates all three poll workers from the same party work at the voting booth. Advantage indicates that two out three poll workers from the same party work at the voting booth. Other refers to a poll worker that is not registered as supporting the Colorado or Liberal party. The excluded category corresponds to voting booths with "fair allocations" having one Colorado party poll worker, one Liberal poll worker, and one "other" poll worker. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables.

6.1 Heterogeneity by Electoral System

Next, to test Hypothesis (3) we explore the heterogeneous effect of partisan poll workers by electoral system, which differs depending on the electoral race. Two of these races are defined by SMDP voting (president and governor), whereas the remaining four are defined by a PR system (senator, MERCOSUR parliament, deputies, and departmental council). These electoral systems provide distinct incentives for electoral manipulation, as there is greater scope for cooperation in electoral manipulation with the PR races. This is because the dominant parties' poll workers present can collude by taking votes away from parties without poll workers and redistributing those votes among themselves, which would increase the number of legislative seats for the colluding parties. This potential collusion is alluded to on the newspaper infographic from SI Figure B4 and apparently occurs on the tally from SI Figure B1. On the other hand, with plurality voting there can only be one winner, so it is in the interest of each party to take away votes from all opposing parties, leaving less scope for collusion. In general, our results show that collusion does in fact take place, with dominant parties' poll workers colluding to re-distribute the votes of smaller, absent parties, among themselves.

Table 3 pools observations from all elections together and runs equation (2) to examine the differential effect of partisan poll workers by electoral system. With the Colorado party vote share we find no differential effect of partisan poll worker allocations by electoral system because none of the coefficients from the interaction terms are significant. With the Liberal/GANAR vote shares we find that the interaction coefficient of PR race and having two Colorado party poll workers and one Liberal poll worker is *positive* and significant at the 10 percent level, with a coefficient of around 0.17 pp for the Liberal/GANAR vote share. Hence, although the allocation of two Colorado party poll workers and one Liberal poll workers tends to lower the Liberal/GANAR vote shares in SMD plurality races, this is compensated for in PR races. This is exactly the pattern we would expect to find if the Colorado and Liberal poll workers colluded more often in PR races, to the

detriment of other parties not represented by their own poll workers. This also suggests that the behavior found on the vote tally from SI Figure B1 with two Colorado poll workers and one Liberal poll worker might be more systematic than anecdotal.

With the vote share of other parties, we observe two main results. First, in PR races when the Colorado party has two poll workers and the Liberal party has one poll worker counting votes the vote share of other parties decreases significantly by 0.29 pp. Second, in PR races two Liberal poll workers and one Colorado party poll worker lead to a significant (at the 10 percent level) decrease of 0.14 pp on the vote share of other parties. These findings are also consistent with Hypothesis (3), indicating a pattern of differential incentives for electoral manipulation in PR races. Both of these partisan poll worker allocations have other parties lacking poll worker representation at these tables and these allocations lead to significantly lower vote shares for the other parties while the traditional parties represented benefit. Hence, results from this table show suggestive evidence that collusion between traditional party poll workers and greater electoral manipulation (to the detriment of other parties) are more likely with PR races.

7   Discussion

Substantively, our empirical results show four things. First, we show that having more poll workers benefits political parties. On average, having one more partisan poll worker compared to a "fair allocation" of poll workers (one Colorado, one Liberal, and one non-Colorado/Liberal) yields about a 0.5 pp (0.2 pp) vote share increase for the Colorado party (Liberal party) at each voting booth. In this context, it is less likely these effects indicate "honest mistakes" given that the electoral results systematically benefit the party of the poll workers represented, albeit by a small magnitude.

Second, although small, these effects are possibly an underestimate of the true effect that poll workers have on electoral outcomes. Our identification strategy focuses on analyzing variance *within* polling stations, and effectively discards variance *between* polling stations. This means we

Table 3: Effect of partisan poll worker composition on election results by electoral system

	Colorado vote share (1)	Liberal/GANAR vote share (2)	Other party vote share (3)
Colorado trifecta × PR race	-0.5625	0.1364	0.4261
	(0.4166)	(0.3948)	(0.3124)
Colorado advantage + Other × PR race	0.0317	0.0117	-0.0434
	(0.1976)	(0.1750)	(0.1440)
Colorado advantage + Liberal × PR race	0.1232	0.1718*	-0.2949***
	(0.1032)	(0.0982)	(0.0754)
Liberal advantage + Colorado × PR race	0.0514	0.0887	-0.1401*
	(0.1097)	(0.1072)	(0.0848)
Liberal advantage + Other × PR race	0.1243	-0.1741	0.0498
	(0.3316)	(0.3116)	(0.2596)
Liberal trifecta × PR race	0.0301	-0.6823	0.6522
	(1.1852)	(1.2005)	(0.8066)
Other poll worker allocation × PR race	0.1203	-0.1856	0.0653
	(0.1356)	(0.1292)	(0.1024)
Colorado trifecta	0.6614**	-0.6040*	-0.0574
	(0.3292)	(0.3248)	(0.1983)
Colorado advantage + Other	0.4104***	-0.5047***	0.0943
	(0.1575)	(0.1485)	(0.0877)
Colorado advantage + Liberal	0.4295***	-0.4957***	0.0663
	(0.0831)	(0.0816)	(0.0449)
Liberal advantage + Colorado	-0.0673	0.1469*	-0.0796
	(0.0883)	(0.0874)	(0.0511)
Liberal advantage + Other	-0.2959	0.1130	0.1830
	(0.2627)	(0.2648)	(0.1667)
Liberal trifecta	-1.9683**	0.9328	1.0355**
	(0.9019)	(0.9306)	(0.4775)
Other poll worker allocation	-0.0564	-0.0345	0.0909
	(0.1096)	(0.1075)	(0.0635)
Mean of Dependent Variable	41.5808	34.4445	23.9746
Polling station-elect. race FE	X	X	X
Colorado voter prop. control	X	X	X
Liberal voter prop. control	X	X	X
Other party voter prop. control	X	X	X
Observations	117,229	117,229	117,229
R^2	0.8425	0.8869	0.9308

Note: A unit of observation is a voting booth-electoral race combination. Standard errors are robust. The Liberal party always ran separately or through the GANAR alliance (while mainly proposing its own candidates), hence we have an outcome variable for Liberal/GANAR vote shares. Vote shares are calculated by dividing by the number of valid votes (i.e., all votes excluding null and blank votes) and multiplying by a 100. A trifecta indicates all three poll workers from the same party work at the voting booth. Advantage indicates that two out three poll workers from the same party work at the voting booth. Other refers to a poll worker that is not registered as supporting the Colorado or Liberal party. The excluded category corresponds to voting booths with "fair allocations" having one Colorado party poll worker and one Liberal poll worker. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables. "PR race" is an indicator variable for electoral races with a proportional representation (PR) system. The coefficient for PR race is omitted because it is collinear after controlling for polling station-electoral race fixed effects.

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are able to rigorously identify fraud taking place when one electoral table varies in terms of results with another *within the same polling location*. However, if fraud is committed on a polling station as a whole, our regressions would not be able to pick up that effect given that we need variance at the voting booth level. As fraud likely varies at the polling station level too, our discovered effects should be taken as a lower-bound of the true effects. Notwithstanding, in SI Section F we find that one departmental council seat would have been won by the Liberal party instead of the Colorado party if we simulate the electoral results with each electoral table as having a "fair" poll worker allocation (one Colorado, one Liberal, and one poll worker that is neither Colorado nor Liberal).

Third, we also found effects for smaller political parties, yet these effects differed in nature. When all three poll workers at an electoral table belonged to the Colorado and Liberal parties, then other parties tended to lose votes—regardless of which of the two parties held a poll worker majority. This finding provides evidence indicative of collusion between both traditional parties to the detriment of smaller political parties. Our regressions provide suggestive evidence that the two dominant traditional parties in Paraguay act in a coordinated fashion to protect their privileged position in the current electoral system.

Finally, given the independent paper ballots used in Paraguay for each electoral race, we explored whether electoral fraud was carried out strategically in Paraguay. Cox (1997) has previously argued that voters act strategically to minimize "wasted votes" when choosing a candidate. At the same time, poll workers face strategic choices when deciding when to count votes accurately and when to commit fraud. For example, we had indicated that there is greater scope for collusive fraud with PR because poll workers present can collude to steal and re-distribute the votes of absent parties among themselves. This sort of collusive fraud is less likely with SMDP races because having a single winner implies all parties compete against each other. The traditionally dominant political parties collude most strongly to the detriment of smaller political parties in PR elections. Hence, although SMDP electoral systems incentivize voters to gravitate towards dominant parties' candidates through strategic voting (Cox 1997), we find that poll worker allocations can be used

by dominant parties to artificially lessen the political prospects made available to smaller parties through PR elections. In other words, vote counting fraud can dampen the effect of more permissive electoral rules towards smaller political parties.

8 Conclusion

Electoral irregularities reduce the accountability role of elections. In Paraguayan elections, the system for counting votes is partisan and adversarial. In theory this is a neutral system which protects votes because parties mutually control results, leading to an accurate count. Yet we have shown that in Paraguayan elections political parties have unequal poll worker representation across voting booths and that this affects how their votes are counted.

Our models showed that parties able to have a majority of poll workers in a single booth receive a systematic advantage in the electoral results registered in those same booths—independent of voter preferences. We also uncover how incentives for electoral manipulation vary by electoral system. Our findings point to a greater scope for collusion in electoral fraud among dominant parties' poll workers within PR races, because distributing small-party votes among themselves can help the parties present earn seats for their legislative candidates.

In sum, our paper shows another reason why political parties are important to the functioning of democratic political systems. If "ambition must be made to counteract ambition" as James Madison famously stated in Federalist No. 51, then it is important that the different parties or factions are of somewhat equal capacity, so that none may fully dominate. The comparable capacity of parties to access, defend, and lobby for their rights is not a given throughout the world. As Lehoucq (2002) and Hartlyn, McCoy and Mustillo (2008) argue, electoral systems where non-partisan officials are responsible for organizing and certifying election results tend to fare better in terms of electoral integrity than those where partisan officials are in charge. Our study points to the conclusion that capacity-matched parties may produce fair results through adversarial electoral systems as much

as it provides evidence that varying-capacity parties may produce unfair results.

As a whole, we have shown that party capacity matters for elections. In the future, reformers and academics should pay attention not only to the electoral institutions that structure how elections work, but also to the party system with similar-capacity or varying-capacity political parties. Overall, having fewer parties which are similar in operational capacity is likely to produce fairer electoral results—particularly with adversarial control systems.

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Getting a seat at the (electoral) table: Partisan poll workers and electoral bias

Supplemental Information

A   Supplemental Information Figures

Figure A1: Image of the paper ballot for the senatorial election
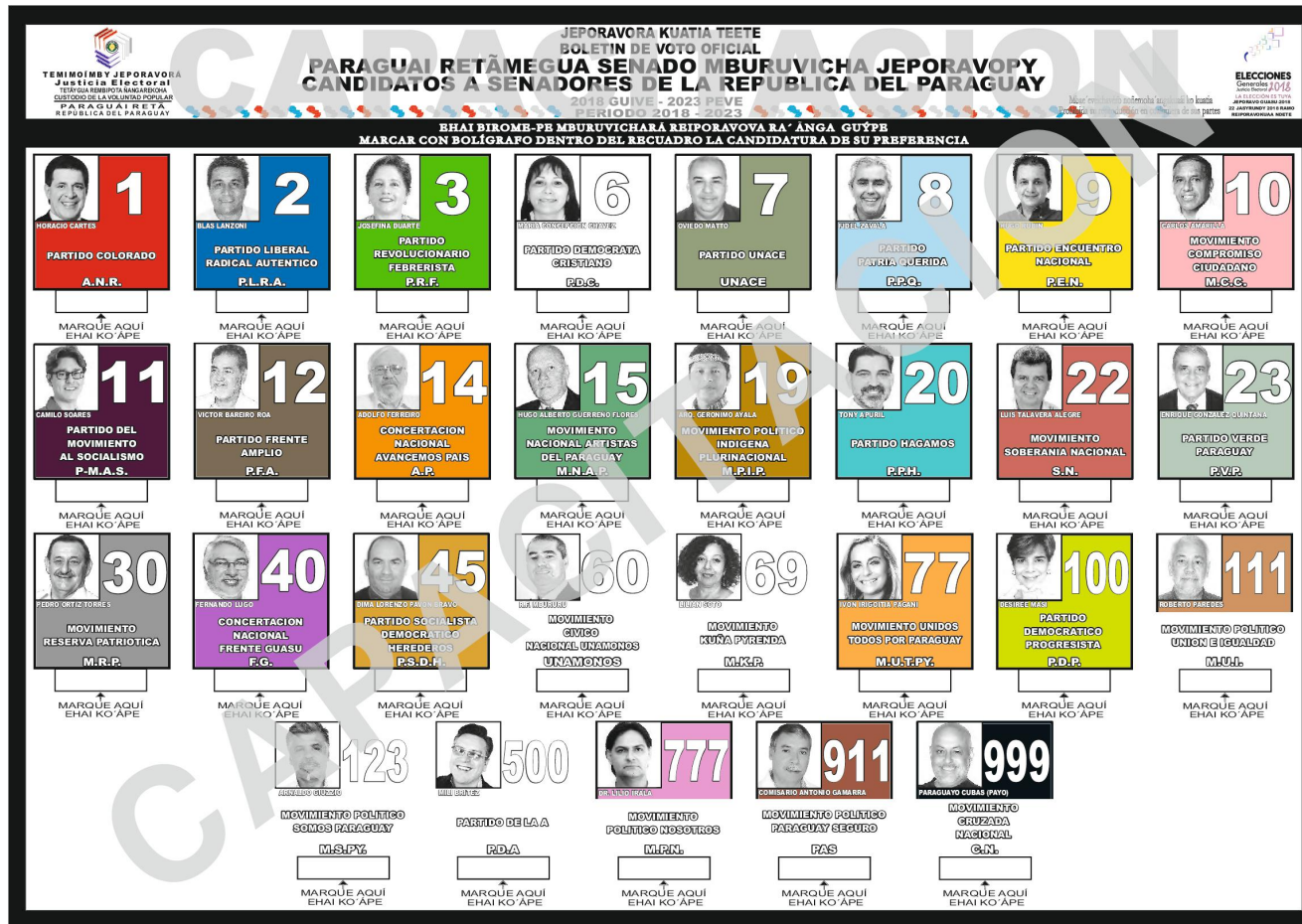
Figure A2: Image of an electoral table with voting booth and poll workers

Note: this figure shows a common setup for electoral tables in Paraguayan elections. Polling stations tend to be in public schools and voting booths tend to be installed in classrooms. The three poll workers set up a table for checking voters' ID cards outside a classroom before allowing them to vote. The picture is from: https://es-us.finanzas.yahoo. com/noticias/paraguay-celebrar%C3%A1-elecciones-municipales-10-204613200.html.

B Additional Background Information and Context

As a motivating example of what is mentioned in Section 3, we consider an electoral table where the official results were challenged because the quick count tally had visible modifications to its counts. Figure B1 shows the senatorial race quick count tally for an electoral table with visible modifications. The modifications to the results are as follows: Colorado party +15, Liberal party +15, PPQ -20, PPH (*Hagamos*) party -10. Figure B2 shows Stata output of the official senate race results for the voting booth that had its official results challenged. These official election results data was obtained from the election authority (the TSJE). Comparing this figure with the previous one we can confirm that the modifications remain in the official results. Figure B3 shows Stata output of the partisan support and the ID numbers of the poll workers from the electoral table that

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had its official results challenged. Two are from the Colorado party and one is from the Liberal party. Neither PPQ nor PPH had poll worker representation at this electoral table. Thus, with this electoral table we observe a presumptive case of collusive fraud benefiting the traditionally dominant parties present, at the expense of smaller parties.[1] We expect this type of collusive fraud to be more common with the PR races for legislative positions compared to the executive elections (president and governor) which are determined by plurality voting.

As mentioned in Section 3, besides the poll workers, some parties may have poll watchers (*veedores*) and empowered party officers (*apoderados*) witnessing the count, though their presence at the count is not required and they cannot count the ballots themselves. Poll watchers are allowed to access the polling station where they are posted and sit next to the electoral table where they will observe the voting process. They can also present written claims and protests, and are allowed to sign the vote tallies, though their signature is not required (unlike that of poll workers). Empowered party officers have the right to freely access the polling stations, examine the count process, to make claims, protest results, and to receive a copy of the vote tallies filled out by a poll worker. While poll watchers tend to stick with a specific electoral table throughout the election, empowered party officers work at the polling station level and can observe the electoral process at multiple distinct electoral tables.[2] Collectively, the poll workers, poll watchers, and empowered party officers are called electoral agents (*agentes electorales*). The presence of poll watchers and empowered party officers tends to vary depending on how remote the polling station is, with urban localities having a greater number of electoral agents. Anecdotally, the inequality in overall electoral agent representation among parties tends to be greater in more rural and remote areas, which benefits parties capable of sending poll workers to these locations.

The 2018 general elections involved six different electoral races: (1) president and vice-president, (2) senators, (3) MERCOSUR (regional trade bloc) parliament, (4) deputies, (5) departmental governor, and (6) departmental council. The first three positions are elected nationally among all Paraguayan voters, whereas the latter three are elected at the departmental level. Paraguay is divided into 17 departments and one capital district. Given that the capital district is not a department, voters from the capital district do not elect a departmental council or governor (a similar function is already covered by the capital's municipality mayor and municipal council). The capital district still elects deputies who represent the capital however. In addition, Paraguayans voting abroad in polling stations setup in Argentina, the US, Spain, and Brazil did not vote for deputies, the departmental council, or departmental governor.

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[1]The case with this electoral table is particularly flagrant given the visible modifications to the tally. There are other cases where the counts were presumably manipulated from the start, so there are no visible modifications. For example, the cases mentioned by Colmán Gutiérrez (2018) and ABC Color (2018*b*) show that the parties they voted for received 0 votes according to the quick count tallies of their voting booths.

[2]Because empowered party officers work at the polling station level, our polling station fixed effects already absorb their effect.

Figure B1: Quick count tally of voting booth whose official results were challenged, with visible modifications

Note: the picture above shows the senate race quick count tally for a voting booth whose official results were challenged with visible modifications. The modifications to the results are as follows: Colorado party +15, Liberal party +15, PPQ -20, PPH (*Hagamos*) party -10.

Figure B2: Stata output showing the electoral results of a voting booth that had its official results challenged

```
. list *_vote_sen if mesaid=="11_3_0_1_66"
```

9310.	ANR_vo~n	AP_vot~n	CN_vot~n	FG_vot~n	MCC_vo~n	MKP_vo~n	MNAP_v~n	MPIP_v~n	MPN_vo~n	MRP_vo~n	MSPY_v~n	MUI_vo~n	MUTPY_~n	PAS_vo~n	PDA_vo~n
	50	0	7	6	2	2	0	1	0	3	3	0	0	1	1

	PDC_vo~n	PDP_vo~n	PEN_vo~n	PFA_vo~n	PLRA_v~n	PMAS_v~n	PPH_vo~n	PPQ_vo~n	PRF_vo~n	PSDH_v~n	PVP_vo~n	SN_vot~n	UNACE_~n	UNAMON~n
	0	7	1	0	32	2	2	5	1	0	2	1	2	0

Note: the picture above shows Stata output of the official senate race results for a voting booth that had its official results challenged. The official election results data was obtained from the election authority (the TSJE). Comparing this figure with the previous one we can confirm that the following modifications remain in the official results: Colorado party +15, Liberal party +15, PPQ -20, PPH (*Hagamos*) party -10.

Figure B3: Stata output showing the partisan support and ID numbers of poll workers from a voting booth that had its official results challenged

mesaid	f_v1_part	f_p_part	f_v2_part	f_v1_cedula	f_p_cedula	f_v2_cedula
11_3_0_1_66	PLRA	ANR	ANR	3653742	1540605	4177951

Note: the picture above shows Stata output of the partisan support and the ID numbers of the poll workers from an electoral table that had its official results challenged. The data on partisan support and registration come from the election authority (the TSJE) and the political parties themselves. Two of the poll workers belong to the Colorado party and one belongs to the Liberal party. Neither the PPQ nor PPH had poll worker representation at this electoral table.

The main irregularities that colluding coalitions can perform with paper ballots include miscounting and tampering with the paper ballots (see Figure B4 for a newspaper infographic from ABC Color (2018a) alluding to how colluding coalitions of poll workers could alter the count). ABC Color (2018a) also indicates how vote monitoring (violations of voting secrecy) could occur with paper ballots (Rueda 2017). Carlos María Ljubetic, a previous director of the TSJE, acknowledged this can occur as follows. Political brokers buying votes tell voters to write in particular marks on their paper ballots that the partisan poll workers could tally to confirm the vote buying agreements were followed through on. Another vote-monitoring method that Ljubetic indicated during a lecture to DENDE (a civil society NGO) that one of us attended was that partisan poll workers could mark ballots given to certain voters such that when they count the votes for these voters they can determine who they voted for. In particular, because the poll workers have to sign the paper ballots given to voters before the voters submit their paper ballot, these poll workers can modify their signatures to later on recognize these ballots during the vote count.

These sorts of irregularities have been an open secret even among the diplomatic community in Paraguay. A leaked diplomatic cable due to Wikileaks coming from the U.S. Embassy of Asunción (2008) remarked the following a few weeks before the 2008 Paraguayan general elections:

> In coming weeks before the elections, all sides will engage in vote-buying, as well as buying (or attempted buying) of the political party representatives who will sit at each polling station on election day. No one does this better than the Colorados. Castiglioni supporters predict the Colorados will steal around 100,000 votes at roughly 700 polling stations (where they already dominate) by altering the electoral tally sheets ("Actas"). Most agree (and history proves) that this is easy to do and difficult to prove, because the ballots are destroyed once voting ceases and the Actas are signed.

The previous quote highlights how diplomats from the U.S. Embassy in Paraguay were convinced that political parties would bribe poll workers sitting at the electoral tables. It also highlights their belief that the hegemonic Colorado party does this better than other political parties. Castiglioni was Paraguay's vice president from 2003-2008 and a Colorado presidential candidate who lost the party's 2008 primaries. Finally, the cable also claims that vote counting fraud is "easy to do and difficult to prove" given that the paper ballots are destroyed.

Thus, perhaps it is not a coincidence that most of the countries where explicitly partisan representatives can be poll workers or polling station administrators correspond to flawed democracies and hybrid regimes (Economist Intelligence Unit 2022). For example, The Economist (The Economist 2017) revealed recordings of training sessions for partisan poll workers from Honduras's incumbent party in 2017 that included advocating for electoral fraud. Among the main methods mentioned was obtaining poll workers' credentials from smaller parties (in an effort similar to the replacements we document in our context). The 2017 Honduran elections, which were narrowly won by the incumbent amid numerous irregularities (New York Times 2017), could have been determined by partisan poll workers.

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Figure B4: Newspaper infographic describing collusion at electoral tables for tabulation fraud
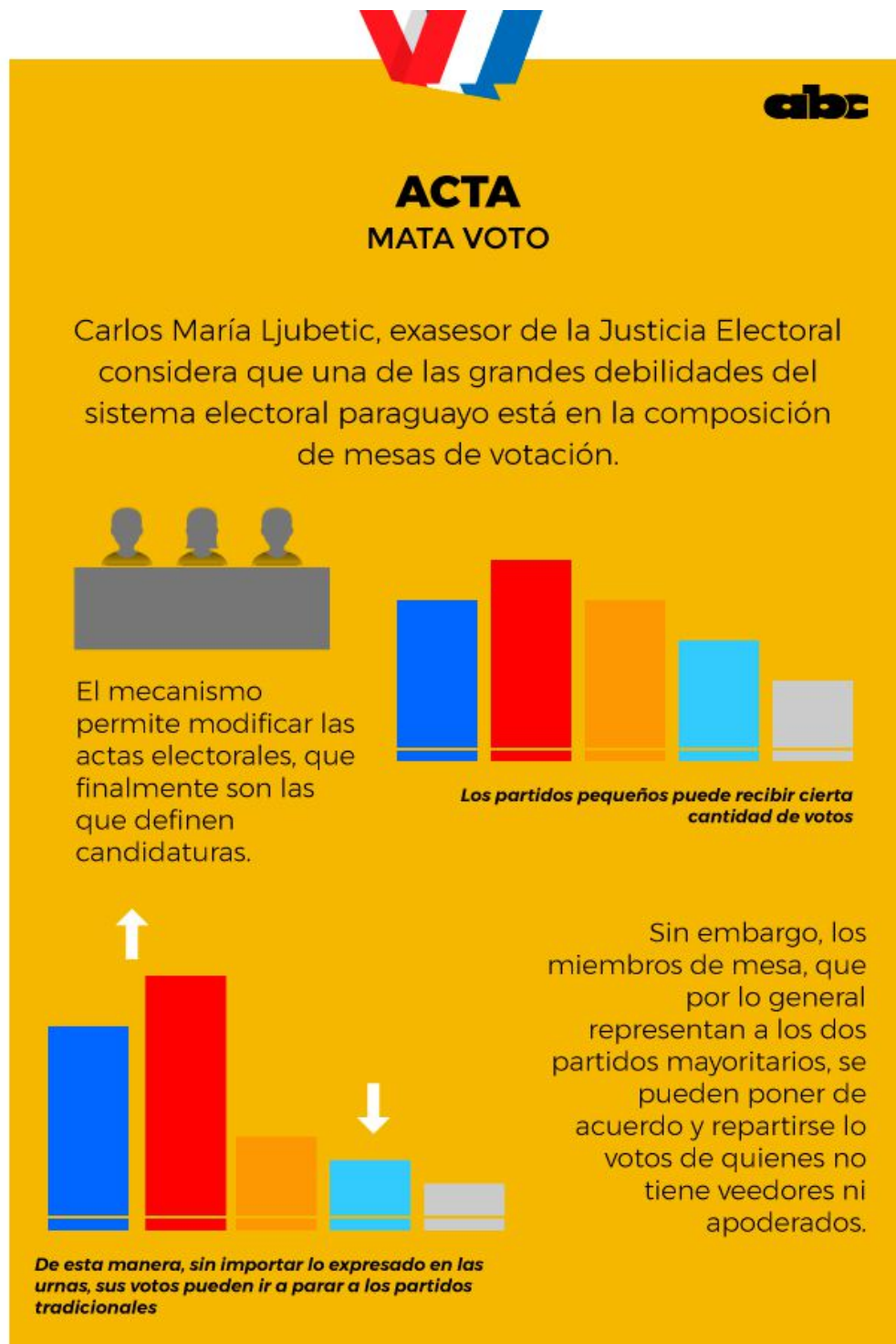
Note: the text above states: "Vote tallies 'kill' votes: Carlos María Ljubetic, former electoral justice adviser considers that one of the great weaknesses of the Paraguayan electoral system is in the composition of electoral tables. This mechanism allows for the modification of the vote tallies, which are ultimately the ones that define the candidacies. Small parties can receive a certain number of votes. However, the poll workers of the table, who generally represent the two major parties, can agree and share the votes of those who do not have their own poll watchers or empowered party officers. In this way, regardless of what is expressed at the polls, their votes can go to the traditional parties."

C Data Construction and Description

The pre-registered poll worker allocation data comes from a spreadsheet obtained from the election authority (the TSJE), which indicates the partisan poll worker representation that was officially approved two weeks in advance of the elections. It notes all the pre-registered electoral agents, that is, poll workers, poll watchers (*veedores*), and empowered party officers (*apoderados*). Most importantly, this data has the political party these pre-registered electoral agents will work for during the election and their national ID numbers.

In addition, the TSJE uploaded scans of every single quick count tally for all electoral races at each electoral table. The data on *de facto* poll workers was compiled by us on the basis of scans of these approximately 120,000 hand-written election-day quick count tallies written by the poll workers themselves. These were briefly published by the election authority on their website and we scraped the election authority's website for them. As the TSJE already shared the electoral results at the voting booth-level, the key additional piece of information that the tally scans provide are the ID numbers of the poll workers at the bottom of each tally (see Figure C1). Figure C2 shows the pre-registered poll workers for the electoral table from Figure C1. Comparing the pre-registered poll workers with those on the tallies shown, we can observe that the Colorado and Liberal pre-registered poll workers showed up on election day, while the FG one was replaced. Using data from the election authority and political parties, we can match the IDs of the poll workers to the parties they work for (if they are a pre-registered electoral agent) and the parties they are registered to.

Although there were a few quick count tallies where none or only a subset of the ID numbers were visible, these are a small minority of all the electoral tables. Out of the 21,211 electoral tables from this election, we have all the ID numbers for 20,365, which is more than 96% of all electoral tables. Hence, there are 846 tallies with at least one missing ID number: 148 with one missing ID, 10 with two missing IDs, and 688 with three missing IDs. Although vote tallies missing one and especially all three ID numbers could be considered irregular, 631 of the vote tallies missing all ID numbers come from special quick count tallies derived from polling stations in remote areas. These are areas where sending a scanned vote tally filled out by the poll workers would have been more difficult due to low internet connectivity. In addition, these were also used in sparsely populated areas which had polling stations with less than three voting booths. For these electoral tables, the results are transmitted through calls via voice.[3] See Figure C3 for a picture showing a voice-transmitted vote tally for a booth in a polling station in the Carmelo Peralta district from the Alto Paraguay department in the Chaco region.

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[3]More information about the quick count tallies, including the voice-transmitted ones, can be found here: https://www.tsje.gov.py/static/ups/docs/archivos/2018/abril/trep_manual.pdf.

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Figure C1: Example quick count vote tallies from a single voting booth

Figure C2: Pre-registered poll workers from example quick count tally shown

0 CONCEPCION	0 CONCEPCION	1 C.R.E.C JUAN E. O'LEARY	1	3561873 F	9/16/1980	PRESIDENTE	TITULAR	1 ANR
0 CONCEPCION	0 CONCEPCION	1 C.R.E.C JUAN E. O'LEARY	1	3563089 F	9/13/1980	VOCAL	TITULAR	2 PLRA
0 CONCEPCION	0 CONCEPCION	1 C.R.E.C JUAN E. O'LEARY	1	5587364 F	12/24/1989	VOCAL	TITULAR	40 FG

Note: This figure shows the pre-registered poll workers from the quick count vote tally shown on Figure C1. Comparing the pre-registered poll workers with those on the tally, the Colorado and Liberal pre-registered poll workers showed up on election day, while the FG one was replaced.

Figure C3: Example vote tallies transmitted via voice for remote polling stations

Note: This figure shows a picture of a quick count vote tally for remote polling stations where electoral results were transmitted to the election authority through a call (via voice) instead of a scan of the vote tally. The vote tally is for a booth in a polling station in the Carmelo Peralta district from the Alto Paraguay department in the Chaco region. Instead of showing the ID numbers of the poll workers at the bottom, it has the name of the election authority employee who received the results via a call.

The problem with the *de jure* pre-registered poll workers is that those who were assigned to be a poll worker according to this data do not always correspond with the *de facto* poll workers on election day. There is usually a considerable number of absentees and replacements that could make the *de facto* poll workers considerably different from those certified in the original list of pre-registered poll workers. Figure 1 shows a histogram of how many poll workers were replaced in our sample of electoral tables where we have the IDs of all three *de facto* poll workers (around 96% of all electoral tables in this election). The figure shows most electoral tables have at least one replacement, and there are around 1,200 electoral tables where all three pre-registered poll workers were replaced. More than a third of the pre-registered poll workers get replaced, as the total number of poll workers replaced from this figure is 21,358.

As mentioned above, to find the *de facto* poll workers we rely on the quick count vote tallies that the TSJE scanned and uploaded to its website after the elections. From the tallies we digitized the ID numbers of those poll workers who were actually present at the electoral table on election day. We merge these ID numbers with nation-wide party registration data sets we obtained from the TSJE (because the election authority collects this data from individual parties) and individual parties themselves. By merging these data sets we can uncover who the poll workers support even if they are not on our pre-registered electoral agents data. By merging these data, we find some cases of poll workers registered to multiple parties. Among all *de facto* poll workers, less than 4% of them (2,514 out of 63,633) are multi-party poll workers and we consider them as a separate category because they are not "pure" partisans.[4] We also find 5,166 poll workers (around 8% of all poll workers) that are not registered to any political party. Although these poll workers may be working for some party and we cannot determine this, it is also possible they are truly independent voters who replaced pre-registered poll workers that did not show up on election day.

Figure 2 shows how the allocation of partisan poll workers changes for the main parties due to replacements of pre-registered poll workers. The histograms show how the pre-registered allocation of poll workers in gray is relatively balanced as the main parties have only one poll worker per electoral table at most electoral tables. In contrast, the election-day *de facto* allocation of poll workers is more skewed towards the two main parties (Colorado and Liberal), particularly the Colorado party. With the *de facto* allocation, the Colorado party has two or more poll workers (a majority) represented at 4,473 electoral tables (around 21% of all electoral tables). The Liberal party has two or more poll workers represented at 2,947 electoral tables (around 14% of all electoral tables). Instead, the FG loses a substantial portion of their poll workers on election day. The FG has two poll workers represented at only 113 electoral tables (around 0.5% of all electoral tables) and it never has three poll workers within a single electoral table.

Table C1 shows the partisanship of poll workers by poll worker function: president, *vocal* 1, and *vocal* 2. With regards to the pre-registered poll workers, we can observe that the table "president" is the most equally distributed among parties.[5] Yet we can notice how the FG and other

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[4]In Paraguay it is not illegal to be registered to multiple parties because this is not regulated.

[5]In results available upon request, we tested whether the partisanship of the poll worker president has an independent effect on electoral results. The results do not show a clear pattern, which could be explained by the fact that ultimately the official result that counts within the tables is that of the majority (a minimum of 2 out of 3 poll workers). Hence, even if the poll worker president

parties have less booth presidents than the Colorado and Liberal parties (although the Colorado party still has approximately 500 more booth presidents than the Liberal party). With the *de facto* poll workers the Colorado and Liberal party have an increase of 758 and 147 table presidents respectively. On the other hand, the FG and other parties lose 2,210 and 644 table presidents respectively. Given that the *vocal* 1 and 2 share the same role and are interchangeable, we can just consider the sum of the two. The Colorado and Liberal party have roughly the same number of *vocal* poll workers at around 15,050. On the other hand, the FG and other parties have 8,743 and 3,084 respectively. With the replacements we can observe that the Colorado party gains 1,046 more *vocal* poll workers, whereas the other parties lose poll workers. The Liberal party loses 1,137, the FG loses 3,555, and the other parties lose 1,350. Finally, we can observe that the replacements vis-à-vis the pre-registered poll worker allocations only fully benefit the Colorado party, as only the Colorado party obtains more poll workers than its pre-registered amount.

Next, we also have the electoral register disaggregated to the electoral table level for the 2018 elections, which gives us the electoral table every voter was assigned to vote in. We merge this electoral register with the partisan support data we have to also measure the proportion of partisans for each party at the electoral table level.

Finally, we obtained legal documents from the election authority indicating all electoral tables where electoral results were contested (*impugnaciones electorales*) at the electoral race level and we codified these into a dataset. For each electoral contestation, we have information on the voting booth and particular electoral race contested, the parties contesting the results, and whether the contestation was accepted. Among the contestation outcomes possible is annulling the tally of the electoral table for the particular race being contested, which entails that zero votes are counted from that electoral table for that particular race. To determine whether a contestation is accepted, the election authority checks the tallies submitted by each of the poll workers. If a majority (two or three) of the poll workers' tallies agree with the electoral contestation, then the results of the tallies are amended. Yet given how this system works and that some parties have an outright majority or collude at a booth, contestations may not be successful despite being legitimate. Overall, there are not many electoral contestations: 3,213 out of 122,595 possible electoral table-race combinations. Out of 3,213 contestations in this election, only 738 were accepted. The low number of contestations may be partly because parties need to have either poll workers, poll watchers, or empowered party officers present to observe irregularities, and only the dominant parties are well-resourced enough to cover most of the country. In addition, given that ultimately the contestations are decided by what the majority of poll workers wrote down, some parties may not even submit a contestation which they expect to be ultimately rejected. This was confirmed to us by some party activists from smaller parties.

Table C2 provides summary statistics for all the variables used in the main tables of the paper, except the vote share outcome variables, which are on Table C3. These variables are defined in detail on Section 5. Tables C4 and C5 share summary statistics for all the variables used in the SI tables, and these variables are defined on SI Section E.

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tallies results a certain way but the two vocals indicate something else (and the vocals' results agree with each other), the official result for that table is what the vocals indicated.

Table C1: Partisan representation of pre-registered and *de facto* poll workers by poll worker function

	President	*Vocal* 1 + *Vocal* 2	*Vocal* 1	*Vocal* 2
Pre-registered poll workers				
Colorado	7,523	15,048	13,901	1,147
Liberal	7,060	15,053	7,066	7,987
FG	4,877	8,743	1	8,742
Other party	1,508	3,086	2	3,084
De facto **poll workers**				
Colorado	8,281	16,094	9,550	6,544
Liberal	7,207	13,916	6,800	7,116
FG	2,667	5,188	1,939	3,249
Other party	864	1,736	629	1,107
Multi-party	732	1,782	754	1,028
Unaffiliated	1,460	3,706	1,539	2,167
Difference between number of *de facto* and pre-registered poll workers				
Colorado	758	1,046	-4,351	5,397
Liberal	147	-1,137	-266	-871
FG	-2,210	-3,555	1,938	-5,493
Other party	-644	-1,350	627	-1,977

Note: This table indicates the partisan support of the pre-registered and *de facto* poll workers and their difference by poll worker function. The electoral table president has a few more responsibilities (including opening up the ballot box) compared to the other two poll workers called *vocal* 1 and *vocal* 2. Given that the *vocal* 1 and 2 share the same role and are interchangeable, we calculate and mainly consider the sum of the two in the second column. The pre-registered poll workers data come from the election authority and indicate those registered in advance to work at the polls as representatives of a particular party. The data on pre-registered poll workers was not available for the electoral tables abroad, two municipalities in the Paraguari department, and 8 additional electoral tables for particular poll worker functions. This explains the approximately 250 pre-registered poll workers less than the *de facto* poll workers. The *de facto* poll workers data is collected by us by digitizing the ID numbers of the poll workers in vote tallies and merging these ID numbers with party registration datasets (for those poll workers that are not pre-registered). The multi-party poll workers are those registered to multiple parties, which are considered as a separate category because they are not "pure" partisans. The "unaffiliated" poll workers are those neither pre-registered as electoral agents nor registered to any political party.

Table C2: Main summary statistics

	Observations	Mean	Standard Deviation
Total pre-registered poll workers replaced at voting booth	21,211	1.1371	0.9316
Percent of Colorado voters at voting booth	21,211	34.2220	10.4397
Percent of Liberal voters at voting booth	21,211	17.3346	9.8823
Percent of other party voters (excluding the Colorado and Liberal parties) at voting booth	21,211	4.0607	2.4103
Number of registered voters at voting booth	21,211	199.9673	14.4187
Equation (1) **indicator variables:**			
Colorado trifecta	21,211	0.0074	0.0857
Colorado advantage + Other	21,211	0.0415	0.1995
Colorado advantage + Liberal	21,211	0.1693	0.3751
Liberal advantage + Colorado	21,211	0.1259	0.3318
Liberal advantage + Other	21,211	0.0130	0.1133
Liberal trifecta	21,211	0.0008	0.0283
Other poll worker allocation	21,211	0.1208	0.3259
Fair poll worker allocation	21,211	0.5211	0.4996

Note: All the means and standard deviations are rounded up to the fourth digit after the decimal.

Table C3: Vote share summary statistics

	Observations	Mean	Standard Deviation
Presidential election vote shares:			
Colorado vote share	21,139	48.625	12.311
GANAR vote share	21,139	45.439	12.564
Other party vote share	21,139	5.936	5.836
Senatorial election vote shares:			
Colorado vote share	21,107	32.765	12.558
Liberal vote share	21,107	24.484	12.643
Other party vote share	21,107	42.752	15.775
MERCOSUR parliament election vote shares:			
Colorado vote share	21,122	42.199	13.042
Liberal vote share	21,122	30.512	13.659
Other party vote share	21,122	27.289	14.068
Deputies election vote shares:			
Colorado vote share	20,932	39.295	14.101
Liberal/GANAR vote share	20,932	30.441	14.704
Other party vote share	20,932	30.264	19.012
Governor election vote shares:			
Colorado vote share	18,910	46.846	12.432
Liberal/GANAR vote share	18,910	42.390	13.713
Other party vote share	18,910	10.764	11.016
Departmental council election vote shares:			
Colorado vote share	18,893	40.423	12.872
Liberal/GANAR vote share	18,893	34.377	13.223
Other party vote share	18,893	25.200	13.246

Note: All the means and standard deviations are rounded up to the fourth digit after the decimal. Vote shares are calculated by dividing by the number of valid votes (i.e., all votes excluding null and blank votes) and multiplying by a 100. The number of observations for the deputies' vote shares is lower as there is no deputies' election for Paraguayan voters abroad. The number of observations is lower for the governor and departmental council vote shares as there is no governor or departmental council election for Paraguayan voters abroad and those in the capital district. There are still slight differences in observations across races due to electoral contestations annulling the vote counts for certain races at some voting booths and missing vote tallies that were not received by the election authority for certain electoral races.

Table C4: Voting process summary statistics

	Observations	Mean	Standard Deviation
Presidential election votes:			
Blank vote share	21,139	2.4354	2.3328
Null vote share	21,139	2.7507	1.9835
Turnout	21,139	122.9003	18.5923
Senatorial election votes:			
Blank vote share	21,107	5.3660	4.0687
Null vote share	21,107	3.6209	2.6598
Turnout	21,107	122.6274	18.8759
MERCOSUR parliament election votes:			
Blank vote share	21,122	8.5624	5.1904
Null vote share	21,122	3.9040	2.7265
Turnout	21,122	122.6298	18.7436
Deputies election votes:			
Blank vote share	20,932	5.2195	3.4318
Null vote share	20,932	3.0546	2.2357
Turnout	20,932	123.3690	17.1111
Governor election votes:			
Blank vote share	18,910	3.7270	2.6408
Null vote share	18,910	2.5854	1.8947
Turnout	18,910	122.2795	16.6151
Departmental council election votes:			
Blank vote share	18,893	6.7350	3.6027
Null vote share	18,893	3.4651	2.5265
Turnout	18,893	122.0788	16.6608

Note: All the means and standard deviations are rounded up to the fourth digit after the decimal. Vote shares are calculated by dividing by turnout (total votes including null and blank votes) and multiplying by a 100. The number of observations for the deputies' votes is lower as there is no deputies' election for Paraguayan voters abroad. The number of observations is lower for the governor and departmental council votes as there is no governor or departmental council election for Paraguayan voters abroad and those in the capital district. There are still slight differences in observations across races due to electoral contestations annulling the vote counts for certain races at some voting booths and missing vote tallies that were not received by the election authority for certain electoral races.

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Table C5: SI analysis summary statistics

	Observations	Mean	Standard Deviation
Percent of GANAR voters at voting booth	21,211	18.4000	9.8830
Percent of other party voters (excluding the Colorado party and GANAR)	21,211	2.9974	2.2157
Equation (3) indicator variables:			
Colorado trifecta	21,211	0.0074	0.0857
Colorado advantage + Other	21,211	0.0275	0.1636
Colorado advantage + GANAR	21,211	0.1833	0.3870
GANAR advantage + Colorado	21,211	0.4419	0.4966
GANAR advantage + Other	21,211	0.0226	0.1487
GANAR trifecta	21,211	0.0050	0.0705
Other poll worker allocation	21,211	0.0726	0.2594
Fair poll worker allocation	21,211	0.2396	0.4268
Equation (4) indicator variables:			
Traditional party trifecta	21,211	0.3035	0.4598
Traditional party advantage + Other party	21,211	0.4130	0.4924
Other party advantage + Traditional party	21,211	0.0136	0.1157
Other party trifecta	21,211	0.0002	0.0154
Other poll worker allocation	21,211	0.2227	0.4160
Fair poll worker allocation	21,211	0.0470	0.2117
Electoral contestation variables:			
Contested electoral result	122,595	0.0262	0.1598
Contested electoral result by a party that is not the Colorado party	122,595	0.0228	0.1493
Contested electoral result by a party that is not the Liberal party	122,595	0.0189	0.1360
Contestation of electoral result accepted	122,595	0.0060	0.0774
Electoral result annulled	122,595	0.0038	0.0615

*Note*: All the means and standard deviations are rounded up to the fourth digit after the decimal.

D   Tests for Correlation Between Voter Preferences and Names

Figure D1 plots the distribution of Colorado and Liberal party support among registered voters of the 2018 election for each of the indicated initials of voters' surnames. The horizontal line plots the overall average of Colorado and Liberal party support. If surnames are independent of party identification, we expect a flat distribution of partisan support among the surname initials. We see that voters support these two parties at around the same overall rate across almost all surname initials. Thus, we have an overall flat distribution of Colorado and Liberal party support among most surname initials. Although there are a few outliers (h, k, w, x, and y), they are spread around different letters and these are letters which have comparatively fewer voters. SI Figure D2 shows that the few surname initials that are farther away from the overall means all have substantially lower frequencies. This can explain why the proportions for these letters do not approach the overall mean as much as other surname initials. Also, neither Colorado nor Liberal party supporters have surnames concentrated towards the end of the alphabet or vice versa. Hence, voters' first letter of their last name does not correlate with their political preferences.

In results available upon request, we additionally test whether the alphabetical ranking of voters' surnames (which determines the voting booth where citizens vote) is uncorrelated with electoral results for this election. To do so, we first calculate the alphabetical ranking of voters' last names within their polling station. This ranking is normalized by the number of voters in each polling station such that all within-polling station rankings go from 0 to 1. That is, voters with the earliest names in the alphabet in their polling station have a ranking that is very close to 0, whereas the voter with the latest name in the alphabet has a ranking of 1. We then calculate the average voter alphabetical ranking that each voting booth has. One table shows regressions of the Colorado party vote share for each electoral race on the alphabetical ranking of the voting booths. We find no significant correlation between the order of voters' last names and their preference towards the Colorado party. The other two tables run similar tests but instead use the Liberal party and GA-NAR vote share respectively. Both of these tables show similar non-significant results. Hence, these placebo tests also indicate that voters' first letters of their last names do not correlate with their political preferences.

Our analyses using data on voters' surnames and their political preferences provide a rationale for our assumption that the assignment of voters to voting booths is an as-if random assignment. Hence, any strong deviance in results recorded across booths within a polling station are likely due to the partisan representation of poll workers in the booth after we control for polling station fixed effects.

Figure D1: Distribution of Party Support by Voter Initials

Voters2018
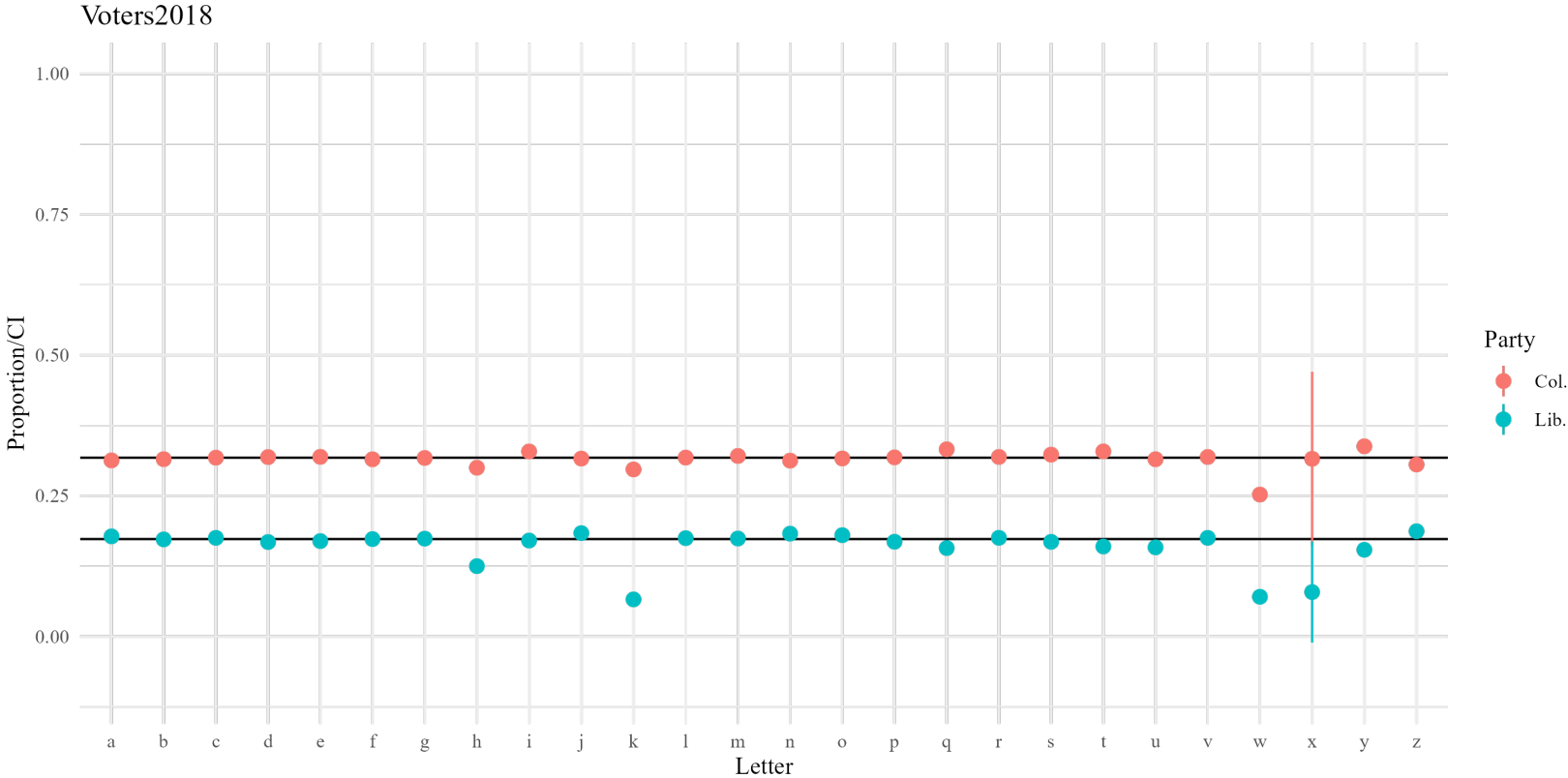
Note: This figure plots the distribution of Colorado and Liberal party support among registered voters of the 2018 election for each of the indicated initials of voters' surnames. The horizontal line plots the overall average of Colorado and Liberal party support. SI Figure D2 shows that the surname initials that are farther away from the overall means (h, k, w, x, and y) have substantially lower frequencies. This can explain why the proportions for these letters do not approach the overall mean as much as other surname initials.

Voters2018: Proportion of voters by letter

Note: This figure plots the proportion of voters' surname initials by letter. This figure shows how the surname initials that are farthest away from the overall means (h, k, w, x, and y) in Figure D1 have substantially lower frequencies.

E   Additional Regression Models and Results

To examine results for the presidential race, we use similar indicator variables to equation (1) except we consider GANAR alliance poll workers instead of just Liberal poll workers. GANAR alliance poll workers are those supporting either the Liberal party, the FG, or other smaller left-wing parties that form part of the alliance.[6] This change also affects who we consider as "other" in the "GANAR advantage + Other" and "Colorado advantage + Other" variables, which now consists of those poll workers not registered as supporting either the Colorado party or the GANAR alliance. Our excluded category then corresponds to voting booths with "fair allocations" having one Colorado poll worker and one GANAR poll worker. Lastly, the indicator variable for "other poll worker allocations" here refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced above. These indicator variables are all mutually exclusive and together cover all voting booths. Our regression specification for presidential race analyses is then as follows:

$$
\begin{aligned}
Y_{ab} = &\beta_0 + \beta_1 GANAR\_Trif_{ab} + \beta_2 GANAR\_Adv\_Oth_{ab} + \beta_3 GANAR\_Adv\_Colorado_{ab} \\
&+ \beta_4 Colorado\_Adv\_GANAR_{ab} + \beta_5 Colorado\_Adv\_Oth_{ab} + \beta_6 Colorado\_Trif_{ab} + \beta_7 Other\_pw\_alloc_{ab} \\
&+ \delta_1 voter\_prop\_Colorado_{ab} + \delta_2 voter\_prop\_GANAR_{ab} + \delta_3 voter\_prop\_Other_{ab} + \theta_a + \varepsilon_{ab}.
\end{aligned}
\tag{3}
$$

For a related follow-up test to the electoral system heterogeneity analysis, we generate new partisan allocation indicator variables by pooling together the Colorado and Liberal poll workers as "traditional party" poll workers, which we contrast with the remaining other party poll workers. We do this because we acknowledge that collusion between traditional party poll workers could even occur with a "fair allocation" having just one Colorado party and one Liberal poll worker, as they would constitute a majority of the poll worker team. We thus generate the following indicator variables: "traditional party trifecta," "other party trifecta," "traditional party advantage + other party," and "other party advantage + traditional party." Our excluded category then corresponds to voting booths with "fair allocations" having only one traditional party poll worker and one poll worker from another party. Thus, the indicator variable for "other poll worker allocations" here refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced above. These indicator variables are all mutually exclusive and together cover all electoral tables. We once again include the interactions between PR race and the indicator

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[6]As mentioned previously, the full list of parties that were part of GANAR are: Liberal party, PRF, PDP, PEN, AP, PMAS, and the FG member parties. Virtually all GANAR poll workers support the Liberal party and FG (28,978 of the 29,294 GANAR poll workers). Only 316 poll workers support one of the other small left-wing parties that were part of GANAR.

variables mentioned previously. This leads us to the following regression specification:

$$
\begin{aligned}
Y_{abc} =\ & \beta_0 + \alpha_1 Tradpart\_Trif_{ab} \times PR_c + \alpha_2 Tradpart\_Adv\_Othpart_{ab} \times PR_c \\
& + \alpha_3 Othpart\_Adv\_Tradpart_{ab} \times PR_c + \alpha_4 Othpart\_Trif_{ab} \times PR_c + \alpha_5 Other\_pw\_alloc_{ab} \times PR_c \\
& + \beta_1 Tradpart\_Trif_{ab} + \beta_2 Tradpart\_Adv\_Othpart_{ab} + \beta_3 Othpart\_Adv\_Tradpart_{ab} \\
& + \beta_4 Othpart\_Trif_{ab} + \beta_5 Other\_pw\_alloc_{ab} \\
& + \delta_1 voter\_prop\_Colorado_{ab} + \delta_2 voter\_prop\_Liberal_{ab} + \delta_3 voter\_prop\_Other_{ab} + \eta_{ac} + \varepsilon_{abc}.
\end{aligned}
\tag{4}
$$

We now show that the effect of partisan poll workers on elections is robust and also explore the effects of partisan poll workers on additional outcomes. We first estimate the effect of allocations of partisan poll workers on each electoral race separately. Second, we look into the impact of partisan poll workers on election process outcomes: blank votes, null votes, and turnout. Third, we explore whether the presence (regardless of the number) of partisan poll workers can explain the electoral results. Fourth, we examine whether certain allocations of partisan poll workers on voting booths lead to more electoral contestations where the counts are challenged.[7]

Table E1 shows the effect of partisan poll workers on the presidential election by running equation (3). In Column (1) we can observe that the Colorado party vote share increases significantly by around 0.45 percentage points (pp) whenever it has two Colorado poll workers counting votes. This result is robust to controlling for the proportion of Colorado, GANAR, and other party voters at each voting booth. Similarly, in Column (2) we can notice that the GANAR vote share increases significantly at the 10 percent level by approximately 0.47 pp when there are two GANAR poll workers and a poll worker not registered to the Colorado party or the GANAR parties. We can also notice how the GANAR vote share decreases by around 0.49 pp whenever the Colorado party has two poll workers counting votes. This result is robust to controlling for the proportion of partisan voters at each voting booth and it is interesting how this result varies symmetrically depending on which party/alliance has a poll worker majority at the electoral table. We do not observe any significant effects of these partisan poll worker allocations on the vote share of other parties. This might reflect the fact that in SMDP races (such as the presidential race) one objective of biased

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[7]In results available upon request, we tested whether the effect of the partisan poll worker allocations varied depending on whether the Colorado or Liberal party was the incumbent party. The incumbent party was defined as the party of the municipal mayor as these usually have a local organizational advantage, particularly the traditional parties. We find that the Colorado vote share further increases when there are two Colorado and one Liberal poll worker at a voting booth and the Colorado party is the incumbent party. On the other hand, the Colorado vote share particularly decreases when there are two Liberal and one other party poll worker at a voting booth and the Colorado party is the municipal incumbent. We also find that the Liberal vote share rises significantly when there are two Liberal and one Colorado party poll worker at a voting booth and the Liberal party is the municipal incumbent. Finally, we also find that the Liberal vote share decreases most when there are two Colorado and one other party poll worker at a voting booth and the Liberal party is the incumbent party.

poll workers might be to take away votes from their main competition, while potentially ignoring the other smaller parties. Next, in Column (4) the blank vote share decreases significantly at the 10 percent level when the allocation is that of two GANAR poll workers and a poll worker not registered to the Colorado party or the GANAR parties. Finally, we do not observe any significant effects on the null vote share or turnout. We also do not find any significant coefficients for the "trifecta" dummies, which may be expected as we do not have many trifecta poll worker allocations for either party (just over 260 booths), leading to low statistical power.

Table E2 examines the effect of partisan poll workers on the senatorial election by running equation (1) (except we use polling station fixed effects instead of polling station-electoral race fixed effects), because for this electoral race the GANAR parties run under separate party lists. We observe a similar pattern for the Colorado and Liberal party vote shares as in Table E1. Whenever the Colorado party has two poll workers counting votes, its vote shares increases significantly by around 0.52/0.53 pp. On the other hand, the Liberal party vote share increases significantly at the 10 percent level by around 0.21 pp when there are two Liberal poll workers and one Colorado poll worker counting votes. In addition, when the Colorado party has two poll workers and there is one Liberal poll worker or one poll worker not registered to the Colorado or Liberal party, the Liberal party vote share decreases significantly by 0.25 pp and 0.34 pp respectively. Next, we observe that if the other parties have no poll worker present (particularly when a voting booth has 2 Colorado and 1 Liberal poll worker) the vote share for other parties goes down significantly by 0.27 pp. A Colorado party trifecta reduces the null vote share significantly (at the 10 percent level) by 0.31 pp. If the Liberal party has two poll workers and there is one Colorado poll worker or one poll worker not registered to the Colorado or Liberal party, the null vote share decreases by 0.10 pp and 0.42 pp respectively. Finally, we do not observe any significant effects on the blank vote share or turnout.

Table E3 explores the effect of partisan poll workers on the MERCOSUR parliament election by running equation (1), because for this electoral race the GANAR parties also run under separate party lists. We observe a very similar pattern for the Colorado and Liberal party vote shares as in Table E2. If the Colorado party has two poll workers and the Liberal party has one counting votes, the Colorado party's vote share increases significantly by 0.59 pp. If instead the Liberal party has two poll workers and the Colorado party has one counting votes, the Liberal party's vote share rises significantly at the 10 percent level by 0.21 pp. Once again, when the Colorado party has two poll workers and there is one Liberal poll worker or one poll worker not registered to the Colorado or Liberal party, the Liberal party vote share decreases significantly by 0.3 pp and 0.52 pp respectively. Next, we continue finding that if the other parties have no poll worker representation (particularly when a voting booth has 2 Colorado and 1 Liberal poll worker) the vote share for other parties go down significantly by 0.29 pp. If there is a Liberal trifecta the blank vote share increases significantly by 1.23 pp. On the other hand, if there is Colorado trifecta the null vote share declines significantly by 0.4 pp. When the Liberal party has two poll workers and there is one Colorado poll worker, the null vote share decreases significantly by 0.15 pp. In contrast, with other poll worker allocations the null vote share rises significantly by 0.15 pp. Finally, we do not observe any significant effects on turnout.

With Table E4 we analyze the effect of partisan poll workers on the deputies election by running

Table E1: Effect of partisan poll worker composition on presidential election results

	Colorado vote share (1)	Liberal/GANAR vote share (2)	Other vote share (3)	Blank vote share (4)	Null vote share (5)	Turnout (6)
Colorado trifecta	0.6563	-0.7630	0.1068	-0.0080	0.0560	-0.8245
	(0.4599)	(0.4658)	(0.2545)	(0.1301)	(0.1519)	(0.7845)
Colorado advantage + Other	0.4175	-0.4820*	0.0644	-0.0679	-0.0228	0.1396
	(0.2689)	(0.2609)	(0.1373)	(0.0708)	(0.0877)	(0.4190)
Colorado advantage + GANAR	0.4488***	-0.4946***	0.0458	0.0260	-0.0571	0.0933
	(0.1236)	(0.1224)	(0.0607)	(0.0389)	(0.0408)	(0.2020)
GANAR advantage + Colorado	-0.0829	0.1409	-0.0580	0.0204	0.0319	0.0115
	(0.1055)	(0.1052)	(0.0512)	(0.0317)	(0.0333)	(0.1694)
GANAR advantage + Other	-0.3968	0.4742*	-0.0774	-0.1392*	-0.0379	0.0740
	(0.2909)	(0.2771)	(0.1438)	(0.0827)	(0.0932)	(0.4439)
GANAR trifecta	0.3197	-0.6510	0.3312	-0.2267	0.0274	0.4049
	(0.5953)	(0.5773)	(0.3167)	(0.1756)	(0.2457)	(0.8039)
Other poll worker allocation	0.3176	-0.1554	-0.1622	-0.0507	-0.0286	0.2621
	(0.2255)	(0.2264)	(0.1098)	(0.0619)	(0.0703)	(0.3503)
Mean of Dependent Variable	48.6944	45.3871	5.9185	2.3829	2.7564	122.8357
Polling station FE	X	X	X	X	X	X
Colorado voter prop. control	X	X	X	X	X	X
GANAR voter prop. control	X	X	X	X	X	X
Other party voter prop. control	X	X	X	X	X	X
Observations	20,287	20,287	20,287	20,287	20,287	19,281
R^2	0.8116	0.8205	0.7958	0.4630	0.2462	0.7312

Note: A unit of observation is a voting booth. Standard errors are robust. Vote shares on Columns (1) to (3) are calculated by dividing by the number of valid votes (i.e., all votes excluding null and blank votes) and multiplying by a 100. Vote shares on Columns (4) to (5) are calculated by dividing by turnout (i.e., all votes including null and blank votes) and multiplying by a 100. The number of observations on Column (6) is smaller because we restrict our sample to booths with exactly 200 registered voters. A trifecta indicates all three poll workers from the same party or alliance (in the case of GANAR) work at the voting booth. Advantage indicates that two out three poll workers from the same party work at the voting booth. Other refers to a poll worker that is not registered as supporting the Colorado or Liberal party. The excluded category corresponds to voting booths with "fair allocations" having one Colorado poll worker and one GANAR (alliance between the Liberal and FG parties, as well as other smaller left-wing parties) poll worker. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables. The sample is restricted to voting booths for which we have the ID numbers of all three poll workers (which is around 96% of all voting booths).

Table E2: Effect of partisan poll worker composition on senatorial election results

	Colorado vote share (1)	Liberal/GANAR vote share (2)	Other vote share (3)	Blank vote share (4)	Null vote share (5)	Turnout (6)
Colorado trifecta	-0.4535	-0.2174	0.6709	-0.1953	-0.3109*	-0.6024
	(0.5754)	(0.4556)	(0.5015)	(0.2276)	(0.1818)	(0.7970)
Colorado advantage + Other	0.5302**	-0.3406**	-0.1896	0.1645	-0.0565	-0.0077
	(0.2357)	(0.1720)	(0.2543)	(0.1079)	(0.0891)	(0.3507)
Colorado advantage + Liberal	0.5185***	-0.2472**	-0.2713**	0.0099	-0.0469	-0.0449
	(0.1194)	(0.1018)	(0.1326)	(0.0545)	(0.0536)	(0.1940)
Liberal advantage + Colorado	-0.0618	0.2154*	-0.1535	0.0372	-0.1044*	0.0854
	(0.1272)	(0.1167)	(0.1469)	(0.0613)	(0.0564)	(0.2146)
Liberal advantage + Other	-0.2183	0.0088	0.2095	-0.0248	-0.4170***	0.6086
	(0.3735)	(0.3259)	(0.4385)	(0.1605)	(0.1552)	(0.6438)
Liberal trifecta	-1.7440	0.4261	1.3179	0.0910	-0.6166	-0.2237
	(1.2990)	(1.5652)	(1.3759)	(0.6409)	(0.5995)	(1.8600)
Other poll worker allocation	0.1012	-0.1956	0.0944	0.0196	0.0563	-0.0627
	(0.1507)	(0.1312)	(0.1714)	(0.0743)	(0.0665)	(0.2653)
Mean of Dependent Variable	32.6369	24.4988	42.8642	5.2841	3.6022	122.5547
Polling station FE	X	X	X	X	X	X
Colorado voter prop. control	X	X	X	X	X	X
Liberal voter prop. control	X	X	X	X	X	X
Other party voter prop. control	X	X	X	X	X	X
Observations	20,257	20,257	20,257	20,257	20,257	19,249
R^2	0.8030	0.8597	0.8476	0.5612	0.1456	0.7075

Note: A unit of observation is a voting booth. Standard errors are robust. Vote shares on Columns (1) to (3) are calculated by dividing by the number of valid votes (i.e., all votes excluding null and blank votes) and multiplying by a 100. Vote shares on Columns (4) to (5) are calculated by dividing by turnout (i.e., all votes including null and blank votes) and multiplying by a 100. The number of observations on Column (6) is smaller because we restrict our sample to booths with exactly 200 registered voters. A trifecta indicates all three poll workers from the same party work at the voting booth. Advantage indicates that two out three poll workers from the same party work at the voting booth. Other refers to a poll worker that is not registered as supporting the Colorado or Liberal party. The excluded category corresponds to voting booths with "fair allocations" having one Colorado poll worker and one Liberal poll worker. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables. The sample is restricted to voting booths for which we have the ID numbers of all three poll workers (which is around 96% of all voting booths).

Table E3: Effect of partisan poll worker composition on MERCOSUR parliament election results

	Colorado vote share (1)	Liberal vote share (2)	Other vote share (3)	Blank vote share (4)	Null vote share (5)	Turnout (6)
Colorado trifecta	0.1034	-0.7374*	0.6340	-0.1638	-0.3999**	-0.8075
	(0.4875)	(0.4354)	(0.4475)	(0.2928)	(0.1950)	(0.7886)
Colorado advantage + Other	0.3285	-0.5169***	0.1885	0.0882	-0.0844	-0.2450
	(0.2348)	(0.1849)	(0.2172)	(0.1306)	(0.0910)	(0.3533)
Colorado advantage + Liberal	0.5868***	-0.3011***	-0.2857**	0.0808	-0.0700	0.0551
	(0.1231)	(0.1078)	(0.1144)	(0.0731)	(0.0517)	(0.1898)
Liberal advantage + Colorado	-0.0009	0.2127*	-0.2118	0.0244	-0.1448***	0.1304
	(0.1334)	(0.1222)	(0.1306)	(0.0825)	(0.0561)	(0.2181)
Liberal advantage + Other	-0.1213	-0.0727	0.1940	0.0041	0.0548	0.4678
	(0.4570)	(0.3195)	(0.4245)	(0.2102)	(0.1903)	(0.7618)
Liberal trifecta	-2.4478	0.6209	1.8269	1.2319**	-0.0940	0.0525
	(1.7716)	(1.5544)	(1.3718)	(0.6263)	(0.5312)	(1.9021)
Other poll worker allocation	0.0748	-0.1439	0.0691	0.0478	0.1466**	0.0812
	(0.1665)	(0.1430)	(0.1583)	(0.0927)	(0.0707)	(0.2511)
Mean of Dependent Variable	42.1341	30.5360	27.3299	8.4776	3.9100	122.5657
Polling station FE	X	X	X	X	X	X
Colorado voter prop. control	X	X	X	X	X	X
Liberal voter prop. control	X	X	X	X	X	X
Other party voter prop. control	X	X	X	X	X	X
Observations	20,273	20,273	20,273	20,273	20,273	19,265
R^2	0.8022	0.8617	0.8485	0.5476	0.1869	0.7168

Note: A unit of observation is a voting booth. Standard errors are robust. Vote shares on Columns (1) to (3) are calculated by dividing by the number of valid votes (i.e., all votes excluding null and blank votes) and multiplying by a 100. Vote shares on Columns (4) to (5) are calculated by dividing by turnout (i.e., all votes including null and blank votes) and multiplying by a 100. The number of observations on Column (6) is smaller because we restrict our sample to booths with exactly 200 registered voters. A trifecta indicates all three poll workers from the same party work at the voting booth. Advantage indicates that two out three poll workers from the same party work at the voting booth. Other refers to a poll worker that is not registered as supporting the Colorado or Liberal party. The excluded category corresponds to voting booths with "fair allocations" having one Colorado poll worker and one Liberal poll worker. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables. The sample is restricted to voting booths for which we have the ID numbers of all three poll workers (which is around 96% of all voting booths).

equation (1). For this electoral race, there are some departments where the GANAR alliance runs together and some where it does not. Also, the parties belonging to GANAR vary across departments for this race, with FG running independently in some departments. However, the Liberal party always runs separately or through GANAR (and mainly proposes its own candidates if it runs under GANAR), so we generate an outcome variable for Liberal/GANAR vote shares. We once again observe a similar pattern for the Colorado and Liberal/GANAR vote shares as in Tables E2 and E3. Whenever the Colorado party has two poll workers counting votes, its vote share grows significantly by 0.46 pp and 0.49 pp. If instead the Liberal party has two poll workers and the Colorado party has one counting votes, the Liberal/GANAR vote share increases significantly by 0.4 pp. Also, when the Colorado party has two poll workers and there is one Liberal poll worker or one poll worker not registered to the Colorado or Liberal party, the Liberal/GANAR vote share decreases significantly by 0.25 pp and 0.5 pp respectively. We again find that if the other parties have no poll workers counting votes the vote share for other parties decreases by 0.28 pp and 0.2 pp. If the Liberal party has two poll workers and there is one Colorado poll worker or one poll worker not registered to the Colorado or Liberal party, the null vote share decreases significantly by 0.10 pp (significant at the 10 percent level) and 0.42 pp respectively. If the Colorado party has two poll workers and there is one Liberal poll worker, the null vote share declines significantly (at the 10 percent level) by 0.08 pp. Finally, we do not observe any significant effects on the blank vote share or turnout.

In Table E5 we analyze the effect of partisan poll workers on the departmental governor election by running equation (1). Similarly to Table E4, we use an outcome variable for Liberal/GANAR vote shares because the Liberal party either runs separately or through the GANAR alliance throughout the whole country for this electoral race. The results from this table are more similar to those of Table E1, as both explore the effects of partisan poll workers on elections defined by SMD plurality voting. We find that whenever the Colorado party has two poll workers counting votes, its vote share grows by 0.39 pp and 0.42 pp. In addition, whenever the Colorado party has two poll workers the Liberal/GANAR vote share decreases significantly by 0.47 pp and 0.48 pp respectively. We also find that "other" poll worker allocations are associated with a significant increase in the vote share for other parties by 0.23 pp. This is plausible because these "other" poll worker allocations consist of any poll worker allocation excluding those that are denoted with the other independent variables and the "fair" allocations having one Colorado and one Liberal poll worker. Hence, these allocations include, for example, those electoral tables with 2 FG poll workers and those that have multiple unaffiliated poll workers who might be independent and more likely to support the non-traditional parties. If the Liberal party has two poll workers and there is one Colorado poll worker, the null vote share declines significantly by 0.10 pp. Finally, we do not observe any significant effects on the blank vote share or turnout.

Finally, Table E6 shows the effect of partisan poll workers on the departmental council election by running equation (1). Similarly to Tables E4 and E5, we use an outcome variable for Liberal/GANAR vote shares because the Liberal party either runs separately or through the GANAR alliance throughout the whole country for this electoral race. We continue finding a similar pattern for the Colorado and Liberal/GANAR vote shares as in Tables E2 to E4. Whenever the Colorado party has two poll workers counting votes, its vote share grows by 0.66 pp and 0.43 pp. In ad-

Table E4: Effect of partisan poll worker composition on deputies' election results

	Colorado vote share (1)	Liberal vote share (2)	Other vote share (3)	Blank vote share (4)	Null vote share (5)	Turnout (6)
Colorado trifecta	0.2758	0.0640	-0.3398	-0.1023	-0.1779	-0.4763
	(0.4673)	(0.3994)	(0.4646)	(0.1999)	(0.1607)	(0.7914)
Colorado advantage + Other	0.4876**	-0.4951***	0.0076	-0.0292	0.0553	-0.0316
	(0.2322)	(0.1825)	(0.2134)	(0.0972)	(0.0870)	(0.3490)
Colorado advantage + Liberal	0.4551***	-0.2518**	-0.2033*	-0.0402	-0.0782*	0.0085
	(0.1159)	(0.1068)	(0.1126)	(0.0513)	(0.0436)	(0.1860)
Liberal advantage + Colorado	-0.1125	0.3970***	-0.2845**	-0.0377	-0.0503	0.0872
	(0.1274)	(0.1266)	(0.1340)	(0.0562)	(0.0492)	(0.2090)
Liberal advantage + Other	-0.3307	0.0677	0.2630	-0.1604	-0.1033	0.6627
	(0.3760)	(0.3130)	(0.3507)	(0.1585)	(0.1374)	(0.5761)
Liberal trifecta	-2.2114	0.7208	1.4906	-0.4972	0.2142	-0.1145
	(1.5302)	(1.3127)	(1.0552)	(0.4973)	(0.4985)	(2.0371)
Other poll worker allocation	0.0239	-0.2210	0.1970	-0.0455	-0.0351	0.0058
	(0.1527)	(0.1398)	(0.1478)	(0.0698)	(0.0565)	(0.2508)
Mean of Dependent Variable	39.1551	30.2855	30.5593	5.1788	3.0362	123.1645
Polling station FE	X	X	X	X	X	X
Colorado voter prop. control	X	X	X	X	X	X
Liberal voter prop. control	X	X	X	X	X	X
Other party voter prop. control	X	X	X	X	X	X
Observations	20,138	20,138	20,138	20,138	20,138	19,134
R^2	0.8486	0.8812	0.9232	0.5051	0.1523	0.6657

Note: A unit of observation is a voting booth. The parties belonging to GANAR vary across Paraguayan departments for the deputies elections, with FG running independently in some departments. however, the Liberal party always runs separately or through GANAR (and mainly proposing its own candidates), hence we have an outcome variable for Liberal/GANAR vote shares. Standard errors are robust. Vote shares on Columns (1) to (3) are calculated by dividing by the number of valid votes (i.e., all votes excluding null and blank votes) and multiplying by a 100. Vote shares on Columns (4) to (5) are calculated by dividing by turnout (i.e., all votes including null and blank votes) and multiplying by a 100. The number of observations on Column (6) is smaller because we restrict our sample to booths with exactly 200 registered voters. A trifecta indicates all three poll workers from the same party work at the voting booth. Advantage indicates that two out three poll workers from the same party work at the voting booth. Other refers to a poll worker that is not registered as supporting the Colorado or Liberal party. The excluded category corresponds to voting booths with "fair allocations" having one Colorado poll worker and one Liberal poll worker. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables. The number of observations is lower for this electoral race as there is no deputies' election for Paraguayan voters abroad. The sample is restricted to voting booths for which we have the ID numbers of all three poll workers (which is around 96% of all voting booths).

Table E5: Effect of partisan poll worker composition on governor election results

	Colorado vote share (1)	Liberal vote share (2)	Other vote share (3)	Blank vote share (4)	Null vote share (5)	Turnout (6)
Colorado trifecta	0.7428	-0.4342	-0.3086	-0.1021	-0.1286	-0.9737
	(0.4735)	(0.4601)	(0.3025)	(0.1847)	(0.1459)	(0.8679)
Colorado advantage + Other	0.4158*	-0.4816**	0.0658	-0.1097	0.0792	-0.0927
	(0.2281)	(0.2109)	(0.1391)	(0.0815)	(0.0704)	(0.3539)
Colorado advantage + Liberal	0.3881***	-0.4713***	0.0832	-0.0041	-0.0634	0.0560
	(0.1220)	(0.1178)	(0.0726)	(0.0444)	(0.0389)	(0.1992)
Liberal advantage + Colorado	-0.0897	0.1880	-0.0983	-0.0070	-0.0969**	0.1161
	(0.1258)	(0.1222)	(0.0803)	(0.0456)	(0.0395)	(0.2070)
Liberal advantage + Other	-0.3790	0.0420	0.3369	-0.1129	0.0011	0.5823
	(0.3616)	(0.3956)	(0.2692)	(0.1252)	(0.1123)	(0.5663)
Liberal trifecta	-1.6390	0.6323	1.0068	0.2508	-0.6177	1.3708
	(1.0998)	(1.1115)	(0.6762)	(0.6359)	(0.4783)	(1.7457)
Other poll worker allocation	-0.1357	-0.0948	0.2305**	-0.0656	0.0155	-0.0833
	(0.1580)	(0.1532)	(0.1053)	(0.0552)	(0.0482)	(0.2598)
Mean of Dependent Variable	46.9013	42.3609	10.7379	3.6921	2.5681	122.1091
Polling station FE	X	X	X	X	X	X
Colorado voter prop. control	X	X	X	X	X	X
Liberal voter prop. control	X	X	X	X	X	X
Other party voter prop. control	X	X	X	X	X	X
Observations	18,144	18,144	18,144	18,144	18,144	17,289
R^2	0.8142	0.8563	0.9083	0.4340	0.2076	0.6474

Note: A unit of observation is a voting booth. The parties belonging to the GANAR alliance vary across Paraguayan departments for the governor elections, with FG running independently in some departments. however, the Liberal party always runs separately or through GANAR (and mainly proposing its own candidates), hence we have an outcome variable for Liberal/GANAR vote shares. Standard errors are robust. Vote shares on Columns (1) to (3) are calculated by dividing by the number of valid votes (i.e., all votes excluding null and blank votes) and multiplying by a 100. Vote shares on Columns (4) to (5) are calculated by dividing by turnout (i.e., all votes including null and blank votes) and multiplying by a 100. The number of observations on Column (6) is smaller because we restrict our sample to booths with exactly 200 registered voters. A trifecta indicates all three poll workers from the same party work at the voting booth. Advantage indicates that two out three poll workers from the same party work at the voting booth. Other refers to a poll worker that is not registered as supporting the Colorado or Liberal party. The excluded category corresponds to voting booths with "fair allocations" having one Colorado poll worker and one Liberal poll worker. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables. The number of observations is lower for this electoral race as there is no governor election for Paraguayan voters abroad and those in the capital district. The sample is restricted to voting booths for which we have the ID numbers of all three poll workers (which is around 96% of all voting booths).

dition, whenever the Colorado party has two poll workers, the Liberal/GANAR vote share drops significantly by 0.51 pp and 0.62 pp respectively. We also find that if only the Colorado party is counting votes at an electoral table through a trifecta then the Liberal/GANAR vote share declines significantly by approximately 1.1 pp. In addition, other poll worker allocations lead to a decline of 0.31 pp in the Liberal/GANAR vote share.

Next, we again see that if the other parties have no poll worker present (particularly when a voting booth has 2 Liberal and 1 Colorado poll worker) the vote share for other parties declines by 0.22 pp. We also notice again that "other" poll worker allocations are associated with a increase in the vote share for other parties by 0.28 pp. Finally, we can observe that if only the Liberal party is counting votes at an electoral table through a trifecta the vote share of other parties rises by 2.5 pp. This coefficient estimate is in comparison to "fair" poll worker allocations having one Colorado and one Liberal poll worker. This coefficient suggests that Liberal poll workers may guard or favor other parties for these particular elections, which is plausible because the Liberal party tends to be in the opposition with the other parties against the Colorado party. At the same time, it is important to note that the Liberal party has trifectas for only 17 tables (compared to the Colorado party which has 158), so this result could be idiosyncratic and is driven by few observations. If the Colorado party has two poll workers and there is one Liberal poll worker, the null vote share declines significantly (at the 10 percent level) by 0.08 pp. Finally, we do not observe any significant effects on the blank vote share or turnout.

Table E7 examines the effect of poll workers on voting process outcomes (blank votes, null votes, and turnout) by pooling together observations from all elections and running equation (1) on its even columns. The dependent variables are blank vote shares, null (invalid) vote shares, and turnout recorded at at each voting booth. Some of the results from Table E7 also show up on the results for the individual races, though because the number of observations is more limited, we might not have enough statistical power to observe as many statistically significant results. In Column (1) we can observe that poll workers do not have a significant effect on blank votes. In contrast, in Column (2) we find that electoral tables with just Colorado and Liberal poll workers significantly decrease the null vote share by around 0.08 pp. We can also notice that Colorado trifectas decrease the null vote share by approximately 0.19 pp. This result suggests that perhaps traditional party poll workers engage in electoral irregularities partly by awarding themselves null votes instead of discarding these. Still, the magnitude of these coefficients is an order of magnitude lower than the effects we observe on party vote shares, hence some of the results we observe on vote shares should be due to poll workers awarding some votes for other parties to their own party as well. Finally, on Column (3) we notice two opposing effects of partisan poll worker allocations. Electoral tables with two Liberal poll workers and one poll worker from neither the Colorado nor Liberal party lead to a significant increase of around 0.62 votes, compared to a mean of around 122.5 turnout per booth. On the other hand, Colorado trifectas lead to a significant decrease of around 0.69 votes, compared to the same average of about 122.5 turnout per booth. This result is more ambiguous because an increase or decrease in turnout could potentially indicate real differences in votes being counted, or results being manipulated by either stuffing ballot boxes or discarding opposition votes.

As an additional test of Hypothesis (3), Table E8 explores the heterogeneous effects of partisan

Table E6: Effect of partisan poll worker composition on departmental council election results

	Colorado vote share (1)	Liberal vote share (2)	Other vote share (3)	Blank vote share (4)	Null vote share (5)	Turnout (6)
Colorado trifecta	0.5310	-1.0895**	0.5585	0.1194	-0.1082	-0.4681
	(0.4845)	(0.4901)	(0.5097)	(0.2401)	(0.1936)	(0.8651)
Colorado advantage + Other	0.4279*	-0.6167***	0.1889	0.1299	-0.0690	-0.1489
	(0.2517)	(0.2004)	(0.2249)	(0.1260)	(0.0885)	(0.3679)
Colorado advantage + Liberal	0.6596***	-0.5145***	-0.1451	0.0279	-0.0872*	0.0176
	(0.1319)	(0.1215)	(0.1227)	(0.0659)	(0.0503)	(0.2008)
Liberal advantage + Colorado	0.0842	0.1363	-0.2204*	-0.0368	-0.0487	0.2002
	(0.1322)	(0.1286)	(0.1285)	(0.0655)	(0.0537)	(0.2101)
Liberal advantage + Other	-0.1209	-0.2000	0.3209	-0.1678	0.1194	0.7217
	(0.4059)	(0.3502)	(0.3600)	(0.2431)	(0.2214)	(0.5918)
Liberal trifecta	-1.3125	-1.2272	2.5397*	-0.4390	-0.3529	1.2137
	(1.4742)	(1.5510)	(1.3661)	(0.5731)	(0.5563)	(1.6937)
Other poll worker allocation	0.0305	-0.3077*	0.2772*	0.0005	-0.0168	-0.1811
	(0.1679)	(0.1588)	(0.1629)	(0.1020)	(0.0701)	(0.2689)
Mean of Dependent Variable	40.3654	34.3802	25.2544	6.7051	3.4382	121.8964
Polling station FE	X	X	X	X	X	X
Colorado voter prop. control	X	X	X	X	X	X
Liberal voter prop. control	X	X	X	X	X	X
Other party voter prop. control	X	X	X	X	X	X
Observations	18,130	18,130	18,130	18,130	18,130	17,275
R^2	0.8084	0.8354	0.8333	0.3534	0.1755	0.6485

Note: A unit of observation is a voting booth. The parties belonging to the GANAR alliance vary across Paraguayan departments for the departmental council elections, with FG running independently in some departments. however, the Liberal party always runs separately or through GANAR (and mainly proposing its own candidates), hence we have an outcome variable for Liberal/GANAR vote shares. Standard errors are robust. Vote shares on Columns (1) to (3) are calculated by dividing by the number of valid votes (i.e., all votes excluding null and blank votes) and multiplying by a 100. Vote shares on Columns (4) to (5) are calculated by dividing by turnout (i.e., all votes including null and blank votes) and multiplying by a 100. The number of observations on Column (6) is smaller because we restrict our sample to booths with exactly 200 registered voters. A trifecta indicates all three poll workers from the same party work at the voting booth. Advantage indicates that two out three poll workers from the same party work at the voting booth. Other refers to a poll worker that is not registered as supporting the Colorado or Liberal party. The excluded category corresponds to voting booths with "fair allocations" having one Colorado poll worker and one Liberal poll worker. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables. The number of observations is lower for this electoral race as there is no departmental council election for Paraguayan voters abroad and those in the capital district. The sample is restricted to voting booths for which we have the ID numbers of all three poll workers (which is around 96% of all voting booths).

Table E7: Effect of partisan poll worker composition on election process results

	Blank vote share (1)	Null vote share (2)	Turnout (3)
Colorado trifecta	-0.0823	-0.1886***	-0.6909**
	(0.0897)	(0.0708)	(0.3317)
Colorado advantage + Other	0.0231	-0.0205	-0.0543
	(0.0423)	(0.0344)	(0.1436)
Colorado advantage + Liberal	0.0167	-0.0753***	0.0263
	(0.0228)	(0.0190)	(0.0786)
Liberal advantage + Colorado	-0.0051	-0.0820***	0.1087
	(0.0244)	(0.0203)	(0.0860)
Liberal advantage + Other	-0.1006	-0.1013	0.6179**
	(0.0703)	(0.0662)	(0.2535)
Liberal trifecta	0.0794	-0.2517	0.2832
	(0.2359)	(0.2199)	(0.7629)
Other poll worker allocation	-0.0181	0.0138	-0.0452
	(0.0307)	(0.0248)	(0.1046)
Mean of Dependent Variable	5.2896	3.2264	122.5388
Polling station-elect. race FE	X	X	X
Colorado voter prop. control	X	X	X
Liberal voter prop. control	X	X	X
Other party voter prop. control	X	X	X
Observations	117,229	117,229	111,493
R^2	0.6147	0.2120	0.6917

Note: A unit of observation is a voting booth. Standard errors are robust. Vote shares are calculated by dividing by turnout (i.e., all votes including null and blank votes) and multiplying by a 100. The number of observations on Column (3) is smaller because we restrict our sample to booths with exactly 200 registered voters. A trifecta indicates all three poll workers from the same party work at the voting booth. Advantage indicates that two out three poll workers from the same party work at the voting booth. Other refers to a poll worker that is not registered as supporting the Colorado or Liberal party. The excluded category corresponds to voting booths with "fair allocations" having one Colorado poll worker and one Liberal poll worker. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables. The sample is restricted to voting booths for which we have the ID numbers of all three poll workers (which is around 96% of all voting booths).

poll workers by electoral system and uses regression specification (4). The difference with Table 3 is that we pool the two traditional parties together and contrast them with poll workers from other parties. We find that a traditional party trifecta of poll workers counting votes increases significantly the vote share of the Colorado party by 0.36 pp. The fact that a traditional party trifecta overall tends to increase the Colorado party vote share is likely because the Colorado party has a majority of poll workers represented more often than the Liberal party does. Next, we observe that a traditional party trifecta of poll workers counting votes leads to a significant rise in the Liberal/GANAR vote share in PR races by 0.35 pp. This result follows our expectations because a traditional party trifecta having a mix of Colorado and Liberal poll workers is more likely to collude in PR races. Hence, we observe a significant increase in the Liberal/GANAR vote share from traditional party trifectas in PR races.

Finally, we can observe how the vote share of other parties varies symmetrically with the number of traditional party and other party poll workers. Whenever the traditional parties have a trifecta counting votes, the vote share of other parties decreases significantly by 0.21 pp. This decrease from traditional party trifectas is compounded in PR races with an additional significant decrease of 0.32 pp. We can also notice how two traditional party poll workers and one other party poll worker counting votes leads to a significant decrease of 0.18 pp. If instead the other parties have two poll workers and the traditional parties have one we still observe a significant decrease of 0.33 pp, yet this is compensated in PR races because we find that this allocation leads to a significant (at the 10 percent level) increase of 0.45 pp. Overall, these results are consistent with Hypothesis (3). Lastly, we find that "other" poll worker allocations lead to a significant decline of 0.22 pp in the vote share of other parties. This result is also plausible because now the "other" poll worker allocations include, for example, electoral tables with two traditional party poll workers and one unaffiliated poll worker (i.e., a poll worker registered as not supporting any political party according to the electoral authority). This sort of partisan poll worker allocations should ultimately benefit the traditional parties more. Hence, the results from this table also suggest that collusion between traditional party poll workers and greater electoral manipulation (to the detriment of other parties) are more likely with PR races.

Table E9 explores whether certain allocations of partisan poll workers on voting booths lead to more electoral contestations where results are challenged. Overall, there are not many contestations in our sample: 3,116 out of 117,742 (2.65%) possible voting booth-electoral race combinations.[8] This is not fully surprising because most often parties need to have either poll workers, poll watchers, or empowered party officers present to observe irregularities and file a contestation. Only the Colorado party and Liberal party (to a somewhat lesser degree) are well-resourced enough to cover most of the country. In addition, the way that contestations are adjudicated is by showing the tallies filled out individually by the three poll workers and confirming that at least two of the three poll workers have tallies that coincide. If at least two tallies coincide, then the results from those tallies are confirmed as the official results. This is a conspicuous weakness of the electoral contestation

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[8]The sample of 117,742 comes from the voting booths for which we have the ID numbers of all three poll workers (which is around 96% of all voting booths). If we consider all voting booths in the elections, we have contestations in 3,213 out of 122,595 (2.62%) possible voting booth-electoral race combinations, as shown on SI Table C5.

Table E8: Effect of partisan poll worker composition on all election results by electoral system distinguishing traditional and other parties

	Colorado vote share (1)	GANAR vote share (2)	Other vote share (3)
Trad. party trifecta	0.3636**	-0.1537	-0.2099**
	(0.1485)	(0.1428)	(0.0870)
Trad. party adv. + Other party	0.2296	-0.0456	-0.1840**
	(0.1459)	(0.1394)	(0.0854)
Other party adv. + Trad. party	0.1328	0.2013	-0.3341**
	(0.2716)	(0.2715)	(0.1596)
Other party trifecta	-0.9501	0.4189	0.5312
	(1.2369)	(1.4207)	(0.9772)
Other poll worker allocation	0.1047	0.1197	-0.2245**
	(0.1531)	(0.1474)	(0.0901)
Trad. party trifecta × PR race	-0.0343	0.3534**	-0.3190**
	(0.1837)	(0.1726)	(0.1386)
Trad. party adv. + Other party × PR race	-0.1125	0.2052	-0.0927
	(0.1805)	(0.1680)	(0.1353)
Other party adv. + Trad. party × PR race	-0.1342	-0.3163	0.4505*
	(0.3366)	(0.3264)	(0.2563)
Other party trifecta × PR race	-0.5722	1.7118	-1.1396
	(1.6076)	(1.6334)	(1.6029)
Other poll worker allocation × PR race	-0.0745	0.2489	-0.1744
	(0.1892)	(0.1776)	(0.1432)
Mean of Dependent Variable	41.5808	34.4445	23.9746
Polling station-elect. race FE	X	X	X
Colorado voter prop. control	X	X	X
Liberal voter prop. control	X	X	X
Other party voter prop. control	X	X	X
Observations	117,229	117,229	117,229
R^2	0.8423	0.8868	0.9308

Note: A unit of observation is a voting booth-electoral race combination. Standard errors are robust. The parties belonging to the GANAR alliance vary across Paraguayan departments for the governor, deputies, and departmental council elections, with FG running independently in some departments. however, the Liberal party always runs separately or through GANAR (and mainly proposing its own candidates), hence we have an outcome variable for Liberal/GANAR vote shares for these races. Vote shares are calculated by dividing by the number of valid votes (i.e., all votes excluding null and blank votes) and multiplying by a 100. A trifecta indicates all three poll workers at the voting booth either support the traditional parties (Colorado and Liberal) or some other party. Advantage indicates that two out three poll workers either support the traditional parties (Colorado and Liberal) or some other party. The excluded category corresponds to voting booths with "fair allocations" having one traditional party poll worker and one poll worker from another party. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables. "PR race" is an indicator variable for electoral races with a proportional representation (PR) system. The coefficient for PR race is omitted because it is collinear once we control for polling station-electoral race fixed effects. The sample is restricted to voting booths for which we have the ID numbers of all three poll workers (which is around 96% of all voting booths).

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process given our evidence that individual political parties tend to have a majority in more than a third of all voting booths, and that some parties may collude at the tally-writing process. If all three tallies differ, then the tally for the relevant electoral race in that voting booth is annulled, meaning that zero votes are counted for that race in that voting booth.

Table E9 shows that contestations are much less common when a single party (either the Colorado or Liberal party) controls a voting booth through a trifecta of poll workers. This is unsurprising because if no poll worker from another party is around, it is less likely any irregularity will be called out. The low number of contestations also implies that even fewer voting booths get their counts amended due to contestations being accepted or that the tally for a particular race at a particular voting booth is annulled. Hence, although contestations are a recourse that political parties use in other contexts to demand greater electoral integrity, this recourse appears to be quite ineffective in the Paraguayan context. Electoral courts are meant to resolve electoral disputes and address allegations of electoral fraud by either recognizing their legitimacy or discarding them if they do not prove legitimate. Given our findings that partisan poll workers tend to favor their own parties, particularly when they have a majority at a voting booth, the fact that we observe less contestations when only one party controls a voting booth is likely problematic.

Table E9: Effect of partisan poll worker composition on electoral contestations

	Contested (1)	Contested by non-Colorado (2)	Contested by non-Liberal (3)	Contestation accepted (4)	Tally annulled (5)
Colorado trifecta	-0.0218***	-0.0167***	-0.0115***	-0.0074***	-0.0051***
	(0.0035)	(0.0035)	(0.0029)	(0.0008)	(0.0007)
Colorado advantage + Other	0.0005	-0.0003	-0.0011	-0.0009	-0.0008
	(0.0026)	(0.0024)	(0.0021)	(0.0012)	(0.0009)
Colorado advantage + Liberal	0.0002	0.0007	0.0006	0.0004	0.0007
	(0.0013)	(0.0012)	(0.0011)	(0.0007)	(0.0005)
Liberal advantage + Colorado	0.0003	0.0005	0.0002	-0.0010	-0.0011**
	(0.0014)	(0.0013)	(0.0012)	(0.0007)	(0.0005)
Liberal advantage + Other	-0.0038	-0.0034	-0.0014	-0.0017	-0.0000
	(0.0036)	(0.0034)	(0.0032)	(0.0018)	(0.0016)
Liberal trifecta	-0.0152***	-0.0144***	-0.0118***	-0.0048***	-0.0037***
	(0.0036)	(0.0034)	(0.0034)	(0.0015)	(0.0012)
Other poll worker allocation	-0.0001	-0.0003	0.0002	0.0005	0.0006
	(0.0018)	(0.0017)	(0.0016)	(0.0010)	(0.0008)
Mean of Dependent Variable	0.0265	0.0230	0.0189	0.0059	0.0036
Polling station FE	X	X	X	X	X
Observations	117,742	117,742	117,742	117,742	117,742
R^2	0.1714	0.1854	0.1255	0.0434	0.0547

Note: A unit of observation is a voting booth. Standard errors are robust. "Contested" is an indicator variable for whether the electoral results for this electoral race and voting booth were contested. "Contested by non-Colorado (Liberal)" is an indicator variable for the voting booth having its results contested by a political party that is not the Colorado party (Liberal party). "Contestation accepted" is an indicator variable for whether the contestation towards the electoral results in this voting booth were accepted by the election authority, thus amending the count. "Tally annulled" is an indicator variable for whether the electoral results from this voting booth were annulled (i.e., 0 votes are counted). A trifecta indicates all three poll workers from the same party work at the voting booth. Advantage indicates that two out three poll workers from the same party work at the voting booth. Other refers to a poll worker that is not registered as supporting the Colorado or Liberal party. The excluded category corresponds to voting booths with "fair allocations" having one Colorado poll worker and one Liberal poll worker. The "other poll worker allocation" refers to any remaining poll worker allocation after accounting for "fair allocations" and the other allocations referenced with the independent variables. The sample includes all electoral races and is restricted to voting booths for which we have the ID numbers of all three poll workers (which is around 96% of all voting booths).

F   Simulation Exercise

To estimate the substantive effects of poll workers' partisanship on electoral outcomes, we carried out simulations that sought to answer the following question:

> **If all electoral tables had a "fair" allocation of partisan poll workers in the 2018 Paraguayan general elections, how much would have electoral results changed?**

To answer this question we compared two different data sets. First, we have the actual electoral outcomes recorded in the 2018 General Elections. Second, using our regression models from Table 2 of the main paper we generated a data set of predicted results for each electoral table assuming a "fair" allocation. Hence, for example, if a given table had a Colorado party trifecta, we would replace that outcome with what our models predict would have been the outcome for that table if it had a "fair" allocation instead, and we do this replacement for all tables that had any poll worker allocation other than the "fair" allocation.[9]. Specifically, we took *all tables with non-fair allocations* recorded in our data, and we replaced these cases with *predicted outcomes of our models had a given table instead had a "fair" allocation.* Then, with our true vote outcomes and our predicted vote outcomes, we simply take a difference between (1) true and predicted vote shares, and (2) true and predicted seat distributions for different parties. These exercises give us an idea of, substantively, how important the role of partisan poll workers is for electoral outcomes in Paraguay.

Table F1 shows the results of this exercise for the presidential results. As can be seen, all else equal, if all tables had a fair allocation of partisan poll workers the ANR (Colorados) would have had 2,944 fewer votes and the Liberal/GANAR alliance would have received 1,001 more votes. This is not enough to change the presidential result, but it is still a relevant amount of vote changes.

Table F2 shows the results of this exercise for senatorial results. As can be seen, although some differences in votes are considerable in size—the ANR for example would have received 2,590 fewer votes if all tables had fair allocations of poll workers—this effect is not large enough to change any seat allocations in favor of one party or another.

Given that the MERCOSUR parliament, like the senate, is elected using a national district, we may expect simulations to behave in a similar manner. Table F3 confirms that this is the case. Although predicted differences seem to be *slightly* larger in the MERCOSUR races than in the Senate races in absolute terms, these differences are still not large enough to change any outcomes at the seat-distribution level.

Table F4 contains the results of the simulation exercise for the Chamber of Deputies in Paraguay. Again, we can see that there are comparable vote changes to what we have seen previously, but

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[9]The dependent variable for our simulation models are also vote shares, as that is what we used in Table 2, but predictions are then converted into absolute votes for each table by multiplying predicted vote shares by the turnout recorded in a given table. However, rather than joining smaller parties into a single "other" category, for the exercises shown in this section our models treated each party separately.

Table F1: Comparison between true and predicted presidential race results

Party	Pred. Vote	True Vote	Vote Diff.
ANR	1,159,121	1,162,065	-2,944
GANAR	1,068,862	1,067,861	1,001
PVP	80,367	80,554	-187
MNAP	15,067	15,064	3
PMPP	9,462	9,478	-16
MRP	9,018	9,097	-79
PFA	8,411	8,293	118
SN	6,974	7,018	-44

Table F2: Comparison between true and predicted senate race results

Party	Pred. Vote	True Vote	Vote Diff.	Pred. Seats	True Seats	Seat Diff.
ANR	733,074	735,664	-2,590	17	17	0
PLRA	549,943	549,032	911	13	13	0
FG	265,631	265,392	239	6	6	0
PPQ	155,642	155,671	-29	3	3	0
PPH	103,471	103,526	-55	2	2	0
PDP	84,195	84,192	3	2	2	0
UNACE	48,455	48,131	324	1	1	0
CN	57,244	56,927	317	1	1	0

these predicted changes in votes are not sufficient to change the electoral results. Similarly in gubernatorial elections the true results showed 13 Colorado winners 1 GANAR winner and 3 Liberal winners, and predicted results show no differences in allocations. Therefore, no governor races were impacted by the effects of poll worker allocations either.

Finally, as Table F5 shows, we were able to find one seat change among Colorado (ANR) and Liberal (PLRA) outcomes in these elections. Again, the changes in votes received by each party seems comparable to what we have seen in other models, but in this case, because of the lower-level of Departmental Council elections, these vote differences were sufficient to change one seat allocation.

Table F3: Comparison between true and predicted MERCOSUR parliament race results

Party	Pred. Vote	True Vote	Vote Diff.	Pred. Seats	True Seats	Seat Diff.
ANR	914,611	917,471	-2,860	23	23	0
PLRA	661,216	660,090	1,126	16	16	0
PPQ	84,380	84,478	-98	2	2	0
FG	100,751	100,051	700	2	2	0
UNACE	45,894	45,577	317	1	1	0
PPH	39,338	39,584	-246	1	1	0
PFA	4,513	4,413	100	0	0	0
MNAP	10,880	10,943	-63	0	0	0

Table F4: Comparison between true and predicted deputy race results

Party	Pred. Vote	True Vote	Vote Diff.	Pred. Seats	True Seats	Seat Diff
ANR	887,806	890,412	-2,606	42	42	0
PLRA	410,168	409,632	536	17	17	0
GANAR	274,396	273,892	504	13	13	0
PPQ	103,540	103,676	-136	3	3	0
PEN	74,314	74,118	196	2	2	0
PPH	74,416	74,415	1	2	2	0
CN	32,961	32,675	286	1	1	0
PFA	20,352	20,213	139	0	0	0

Table F5: Comparison between true and predicted departmental council race results

Party	Pred. Vote	True Vote	Vote Diff.	Pred. Seats	True Seats	Seat Diff
ANR	802,027	804,736	-2,709	130	131	-1
PLRA	444,312	442,825	1,487	56	55	1
GANAR	241,467	241,173	294	48	48	0
PVP	41,623	42,000	-377	3	3	0
PPQ	46,827	46,950	-123	2	2	0
UNACE	51,275	50,837	438	1	1	0
PEN	27,533	27,407	126	1	1	0
AP	15,378	15,514	-136	1	1	0

G   Establishment party support and partisan poll workers

Perhaps it is not a coincidence that most of the countries where explicitly partisan representatives can be poll workers or polling station administrators correspond to flawed democracies and hybrid regimes (Economist Intelligence Unit 2022): Honduras, Armenia, Paraguay, Ukraine, Kosovo, El Salvador, and Colombia. All these countries have a history of dominant parties and their elites could have strategically set up these adversarial electoral institutions to help keep themselves in power. Albertus and Menaldo (2018) study how outgoing authoritarian elites constitutionalize protections for their interests and vote-counting institutions play a fundamental role in this aspect. Consistent with this, if we follow the definition of established parties from Lupu (2016) and use data on 111 Latin American presidential elections going from 1990 to 2018, we find a positive relationship between partisan poll workers and established party support. That is, established dominant parties in Latin America receive higher vote shares in countries with partisan poll workers.

We examined the relationship between establishment party support and partisan poll workers. Established parties according to Lupu (2016) are those "parties that in two consecutive elections either receive a plurality of the vote, winning the first round, or attract no less than one-third of the winning vote share." To make this claim we updated data on 111 Latin American presidential elections going from 1990 to 2018, we can also examine the relationship between partisan poll workers and establishment party support.[10] Hence, using the same definition of established parties for the 18 Latin American countries considered by Lupu (2016) for the time period of the Latin American elections dataset we end up with the following established parties:

- **Argentina:** Partido Justicialista (PJ), Unión Cívica Radical (UCR)

- **Bolivia:** Acción Democrática y Nacionalista (ADN), Conciencia de Patria (CONDEPA), Movimiento al Socialismo (MAS), Movimiento de Izquierda Revolucionario (MIR), Movimiento Nacionalista Revolucionario (MNR)

- **Brazil:** Partido da Social Democracia Brasileira (PSDB), Partido dos Trabalhadores (PT)

- **Chile:**[11] Alianza por Chile, Concertación

- **Colombia:** Centro Democrático (CD), Partido Conservador Colombiano (PCC), Partido Liberal Colombiano (PLC), Partido de la U

- **Costa Rica:** Partido Liberación Nacional (PLN), Partido Unidad Social Cristiana (PUSC)

- **Dominican Republic:** Partido de la Liberación Dominicana (PLD), Partido Reformista Social Cristiano (PRSC), Partido Revolucionario Dominicano (PRD)

- **Ecuador:** Alianza Patria Altiva i Soberana (Alianza PAIS), Izquierda Democrática (ID), Partido Roldosista Ecuatoriano (PRE), Partido Social Cristiano (PSC)

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[10]The Latin American elections data compiled by Baker and Greene (2011) can be found here: https://web.archive.org/web/20230330055805/https://www.colorado.edu/faculty/baker/latin-american-elections-and-ideology

[11]Following Lupu (2016), for Chile we code coalitions instead of individual parties given the "uniquely institutionalized and stable nature of electoral coalitions."

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- **El Salvador:** Alianza Republicana Nacional (ARENA), Frente Farabundo Martí para la Liberación Nacional (FMLN)

- **Guatemala:** Frente Republicano Guatemalteco (FRG), Partido de Avanzada Nacional (PAN)

- **Honduras:** Partido Liberal de Honduras (PLH), Partido Nacional de Honduras (PNH)

- **Mexico:** Partido Acción Nacional (PAN), Partido de la Revolución Democrática (PRD), Partido Revolucionario Institucional (PRI)

- **Nicaragua:** Frente Sandinista de Liberación Nacional (FSLN), Partido Liberal Constitucionalista (PLC)

- **Panama:** Partido Arnulfista (renamed Partido Panameñista), Partido Revolucionario Democrático (PRD)

- **Paraguay:** Asociación Nacional Republicana—Partido Colorado (ANR-PC), Partido Liberal Radical Auténtico (PLRA)

- **Peru:** Alianza Popular Revolucionaria Americana (APRA), Cambio 90, Partido Nacionalista Peruano, Perú Posible

- **Uruguay:** Frente Amplio, Partido Colorado, Partido Nacional

- **Venezuela:** Acción Democrática (AD), Movimiento V República (MVR) [which later became the Partido Socialista Unido de Venezuela (PSUV)], Partido Social Cristiano (COPEI)

SI Table G1 shows that established parties receive higher vote shares in Latin American countries with partisan poll workers. The average (76.8% vs. 66.5%), minimum (34.6% vs. 2.8%), median (83.7% vs. 67.2%), and maximum (100% vs. 99.9%) vote share of established parties in these countries is higher. These results are thus consistent with the importance of partisan poll workers for established parties' electoral success.

Table G1: Established party vote share summary statistics

	Observations	Mean	Standard Deviation	Minimum	Median	Maximum
Without partisan poll workers:						
Established party vote share	73	66.47	26.16	2.76	67.23	99.87
With partisan poll workers:						
Established party vote share	38	76.79	20.00	34.63	83.69	100.00

Note: Each observation corresponds to the vote share for established parties in a Latin American presidential election from 1990-2018. All statistics are rounded up to the second digit after the decimal.